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SEASONAL VARIATION IN INTENSITY OF BRAIN REACTION OF THE ST. LOUIS ENCEPHALITIS IN MICE AND OF ENDEMIC TYPHUS IN GUINEA PIGS

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ENCEPHALITIS IN MICE

During the course of the routine examination of the mouse brains for encephalitis, from the serum neutralization tests reported by Wooley and Armstrong (1934), a disturbing decrease in the frequency

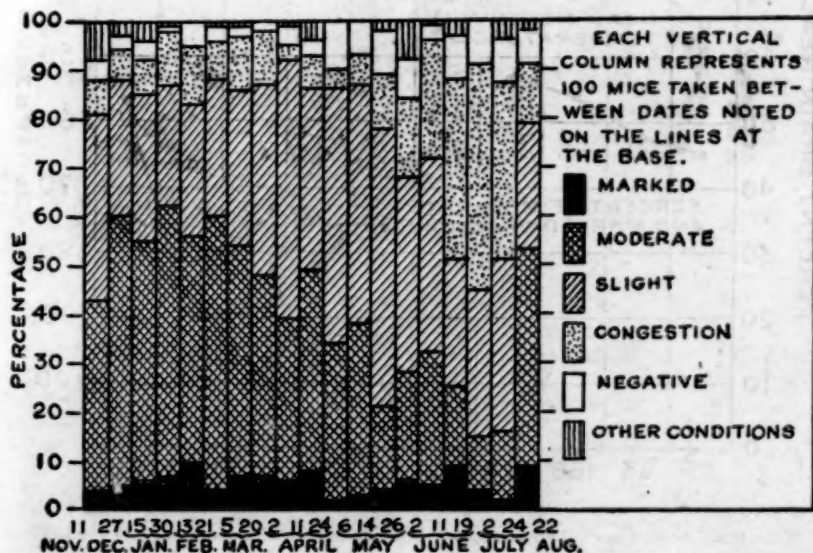


FIGURE 1.—St. Louis encephalitis. Seasonal variation in intensity of brain reaction in mice.

of positive brain reactions occurred in the summer of 1934, so much so that routine brain examinations were discontinued in September, before the conclusion of the serum neutralization series. When the series of over 1,900 mouse brains examined in this study was segregated according to the intensity of reaction, and frequency of inconclusive or nondiagnostic findings, it first became apparent that the changes occurred in an orderly and progressive fashion, and that

just as the series was concluded a marked increase in frequency of positive reactions recurred.

The examinations of the mouse brains were made on a series of three transverse sections, one through the frontal area of the cerebrum and corpora striata, one through parietal and temporal cortex, hippocampus, and thalamus, and the third through pons and cerebellum. Material was fixed usually in Orth's bichromate formalin solution, a few times in Carnoy's absolute alcohol, chloroform, and acetic acid, and stained routinely with the buffered Romanowsky stain (Lillie

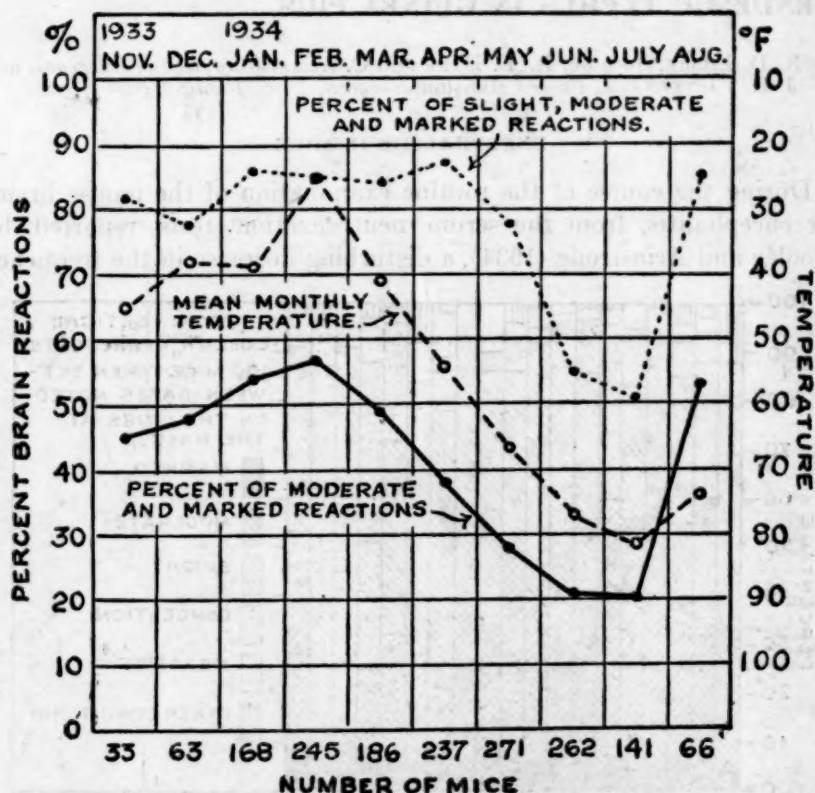


FIGURE 2.—Brain reaction in St. Louis encephalitis in mice and mean monthly temperature (inverted).

and Pasternack, 1932, 1936). The intensity of the reaction was roughly estimated for each area examined, and then the aggregate reaction was graded as marked (++), moderate or average (+), slight (\pm), congestion only (C), or negative (-). About the first 1,300 of these examinations were done by one of us (R. D. L.), the last 600 by another (J. G. P.), and at the transition period about 50 were graded independently by both, to establish uniformity of grading.

Figure 1 and table 1 show the results of these examinations grouped by successive hundreds of mice, with dates between which each hundred came to autopsy. Moderate and marked reactions were seen in 40 to 60 percent of the mice from November to April. There-

after reactions of these grades decreased in frequency to a low of 15 to 16 percent in June and July. In the final hundred moderate and marked reactions rose abruptly to 53 percent. Slight reactions ranged between 25 and 32 percent from December to March, rising to 57 percent in May, dropping again to 25 to 35 percent in June, July, and August. It is more significant that the aggregate of slight, moderate, and marked reactions remains fairly constant between 80 and 90 percent from November 11 to May 14, thereafter falling to a low of 45 percent in the latter part of June, and rising abruptly in August to 78 percent. Negative reactions varied between 1 and 5 percent from November to April, between 3 and 10 percent from May to August. Brains showing appreciable to marked congestion without cellular exudative or proliferative reaction varied between 3 and 11 percent from November to May, rose to 36 to 46 percent in June and July, and decreased to 12 percent in August.

TABLE 1.—Variation in grade of reaction to *St. Louis encephalitis virus* in mice by successive hundreds of mice

	Negative	Congestion	Slight encephalitis	Moderate encephalitis	Marked encephalitis	Lymphocytic chorio-meningitis	Lymphocytic meningitis	Pyogenic	Hemorrhagic	Total
3,929-4,249 (R. D. L.-J. G. P.) Nov. 11-Dec. 27, 1933	4	7	38	39	4	0	6	1	1	100
4,250-4,440 (R. D. L.) to Jan. 16, 1934	3	6	28	55	5	0	2	0	1	100
4,441-4,610 (R. D. L.) to Jan. 30, 1934	4	7	30	49	6	1	1	2	0	100
4,611-4,750 (R. D. L.) to Feb. 13, 1934	1	11	25	55	7	1	0	0	0	100
4,751-4,874 (R. D. L.) to Feb. 21, 1934	5	12	27	46	10	0	0	0	0	100
4,875-5,065 (R. D. L.) to Mar. 5, 1934	3	8	28	56	4	0	0	1	0	100
5,066-5,217 (R. D. L.) to Mar. 20, 1934	2	11	32	47	7	1	0	0	0	100
5,218-5,450 (R. D. L.) to Apr. 2, 1934	2	11	39	41	7	0	0	0	0	100
5,451-5,645 (R. D. L.) to Apr. 11, 1934	4	3	53	33	6	0	1	0	0	100
5,646-5,820 (R. D. L.) to Apr. 24, 1934	3	7	37	41	8	1	1	2	0	100
5,821-5,974 (R. D. L.) to May 6, 1934	10	4	52	32	2	0	0	0	0	100
5,975-6,107 (R. D. L.) to May 14, 1934	7	6	49	35	3	0	0	0	0	100
6,108-6,261 (R. D. L.) to May 26, 1934	9	11	57	17	4	1	0	1	0	100
6,262-6,384 (J. G. P.) to June 2, 1934	8	16	40	22	6	0	3	4	1	100
6,385-6,504 (J. G. P.) to June 11, 1934	3	24	40	27	5	0	0	1	0	100
6,505-6,635 (J. G. P.) to June 19, 1934	9	37	26	16	9	0	2	1	0	100
6,636-6,801 (J. G. P.) to July 2, 1934	9	46	30	11	4	0	0	0	0	100
6,802-7,038 (J. G. P.) to July 24, 1934	9	36	35	14	2	0	0	4	0	100
7,039-7,208 (J. G. P.) to Aug. 22, 1934	7	12	26	44	9	0	1	0	1	100
Total	102	275	662	680	108	5	17	17	4	1,900
Aug. 22-23, 1934 (J. G. P.) residue after last 100	0	1	5	5	0	0	0	0	0	11
Grand total	102	276	667	685	108	5	17	17	4	1,911

The explanation of this apparent seasonal variation seemed to be a relation to the prevailing temperatures (fig. 2). However, it seemed possible that a variation in the average virus dosage might be responsible, and so the series of 1,903 mouse brain records was segregated according to approximate dosage into four groups, those receiving about 1 minimum fatal dose of virus or less, those receiving about 10 minimum fatal doses, 100 minimum fatal doses, and those receiving 1,000 or more minimum fatal doses. The dosage was determined individually for each serum virus mixture. During the course of the serum-testing studies of Wooley and Armstrong the virus dosage was kept adjusted so that with a nonprotective serum there would be partial survival of the group of four mice receiving the smallest virus dosage (approximately 1:3,000,000 dilution), and with the highest virus dosage (approximately 1:3,000) some mice would succumb even with a protective serum. Four serial decimal dilutions were used, four mice to each. If half the mice on the highest dilution survived, the dosage of the lowest dilution was called 1,000 minimum fatal doses, of the second 100 minimum fatal doses, of the third 10 minimum fatal doses, and of the highest 1 minimum fatal dose. The minimum fatal dose was always considered to be that dilution in which approximately half the mice died. Naturally, many irregularities occurred, and hence the estimation of dosage is only approximate. Individual mice dying with histologic evidence of encephalitis after a dosage estimated at 0.1 or 0.01 of the average minimum fatal dose were considered to have received 1 minimum fatal dose.

TABLE 2.—*Relation of virus dosage to histologic reactions*

Virus dosage		-	C	±	+	++	Compl.	Total
1 minimum fatal dose.....	{Number.....	39	122	241	151	21	19	583
	{Percent.....	6.6	20.6	40.7	25.5	3.5	3.2	100.0
10 minimum fatal doses.....	{Number.....	36	96	234	222	27	5	620
	{Percent.....	5.8	15.5	37.7	35.8	4.4	0.8	100.0
100 minimum fatal doses.....	{Number.....	18	52	150	199	35	5	459
	{Percent.....	3.9	11.3	32.7	43.4	7.6	1.1	100.0
1,000 minimum fatal doses.....	{Number.....	5	9	74	116	20	7	231
	{Percent.....	2.2	3.9	32.0	50.1	8.7	3.0	100.0
All.....	{Number.....	98	279	699	688	103	36	1,903
	{Percent.....	5.1	14.7	36.7	36.1	5.4	1.9	100.0

- = Negative.

C = Congestion.

± = Slight encephalitis.

+ = Moderate encephalitis.

++ = Marked encephalitis.

Compl. = Complications without recognizable encephalitis.

This dosage segregation shows that the higher virus dosages give materially higher proportions of more marked histologic reactions. However, when the four dosage groups are again segregated by months, the same seasonal variation in distribution of intensity of reactions

becomes apparent. The summer reduction in proportion of strongly positive reactions is less evident with the highest virus dosage, and the fall upturn appears a month sooner, but the number of animals in this group is relatively small, and it is possible that a larger series would give a seasonal curve more closely paralleling the lower dosage groups. As the sum of marked, moderate, and half of the slight

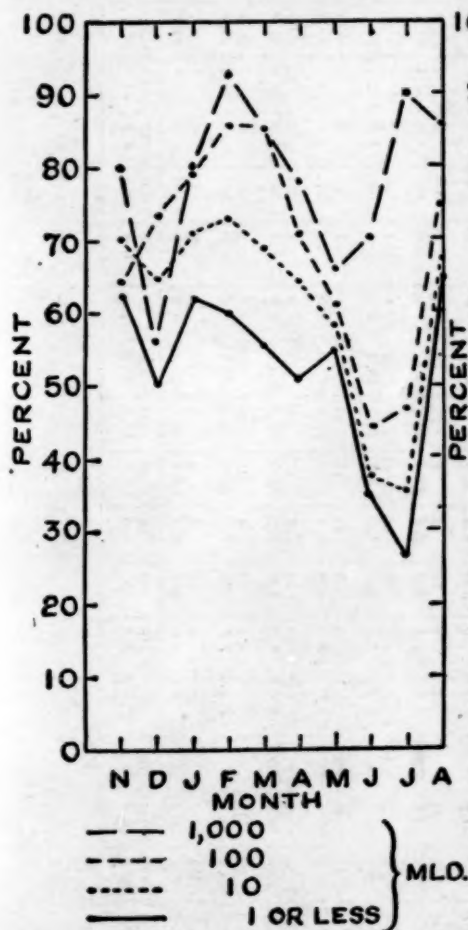


FIGURE 3.—Aggregate percentage of marked and moderate encephalitis and half of slight encephalitis by months, comparing virus dosage—1,000, 100, 10, and 1 or less minimum lethal doses.

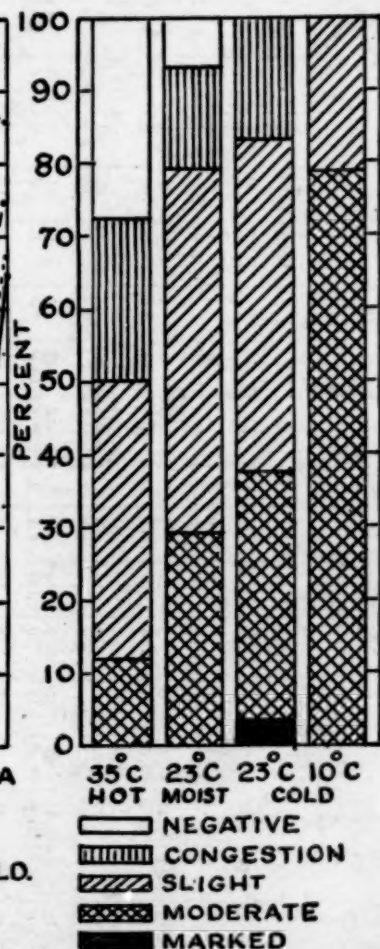


FIGURE 4.—Percentage of slight, moderate, and marked encephalitis and of congestion in experimental series maintained in artificial environment.

reactions represented about one-half of the mice, this value was selected for charting as most nearly representing a median (fig. 3).

The next possible explanation was that a seasonal variation in diet occurred, possibly in the vitamin content of the milk used. Fortunately a series of animals is available in which Armstrong (unpublished experiments) attempted to alter the virus content of the brains by arti-

TABLE 3.—*Variation in grade of reaction to St. Louis encephalitis virus in mice by virus dosage and by months*

MFD reaction	1 MFD						10 MFD						100 MFD								
	-	0	±	+	++	Comp.	Total	-	0	±	+	++	Comp.	Total	-	0	±	+	++	Comp.	Total
1933																					
November.....	0	0	4	3	0	1	8	0	1	7	8	1	1	18	0	1	3	3	0	0	7
	0	0	50.0	37.5	0	12.5	100	0	6.6	58.9	44.4	6.6	5.6	100	0	14.3	42.8	42.8	0	0	100
December.....	2	1	11	5	0	2	21	2	2	5	8	1	0	18	0	4	3	15	1	1	24
	9.5	4.8	52.4	23.8	0	9.5	100	11.1	11.1	27.8	44.4	6.6	0	100	0	16.7	12.5	62.5	4.2	4.2	100
1934																					
January.....	2	9	19	24	3	2	59	3	1	25	28	5	1	63	1	3	10	30	1	1	46
	3.4	16.3	32.2	40.7	5.1	3.4	100	4.8	1.6	39.7	44.4	7.9	1.6	100	2.2	6.5	21.7	65.2	2.2	2.2	100
February.....	5	16	35	38	7	2	103	2	7	25	42	5	0	81	0	4	9	42	6	0	61
	4.9	15.5	34.0	36.9	6.8	1.9	100	2.5	8.5	30.9	60.9	6.2	0	100	0	6.6	14.8	68.9	9.8	0	100
March.....	3	14	31	23	4	1	76	2	7	25	30	4	0	68	1	1	9	26	5	0	42
	3.9	18.4	40.8	30.3	5.3	1.3	100	2.9	10.4	36.8	44.1	5.9	0	100	2.4	2.4	21.4	61.9	11.9	0	100
April.....	7	7	40	14	3	1	72	6	5	46	32	6	1	95	2	1	30	32	4	1	70
	9.7	9.7	55.6	19.4	4.2	1.4	100	5.3	5.3	48.4	33.7	6.3	1.1	100	2.9	1.4	48.9	45.7	5.7	1.4	100
May.....	12	16	46	21	1	3	99	11	11	44	31	1	1	99	3	3	44	18	5	0	73
	12.1	16.3	46.5	21.2	1.0	3.0	100	11.1	11.1	44.5	31.5	1.0	1.0	100	4.1	4.1	60.3	24.7	6.8	0	100
June.....	4	36	32	13	2	3	90	5	37	30	18	2	1	93	5	25	27	15	6	1	79
	4.4	40.0	35.6	14.4	2.2	3.3	100	6.4	39.8	32.3	19.4	2.2	1.1	100	6.3	31.6	34.2	16.0	7.6	1.3	100
July.....	3	22	18	4	1	4	52	4	21	18	10	0	0	53	6	9	8	9	4	0	36
	5.8	42.3	34.6	7.7	1.9	7.7	100	7.5	39.6	34.0	18.9	0	0	100	16.7	25.0	22.5	28.0	11.1	0	100
August.....	1	1	5	6	0	0	13	2	4	9	15	2	0	32	0	1	7	9	3	1	21
	7.7	7.7	38.5	46.2	0	0	100	6.2	12.5	48.9	48.9	6.2	0	100	0	4.8	33.3	42.8	14.3	4.8	100
Total.....	39	122	241	151	21	19	593	36	96	234	222	27	5	620	18	52	150	109	35	5	459
	6.6	20.6	40.7	26.5	3.5	3.2	100	5.8	15.5	37.7	36.3	4.4	0.8	100	2.9	11.3	32.7	42.4	7.6	1.1	100

MFD reaction	1,000 MFD										All doses				
	-	C	±	+	++	Comp.		Total	-	C	±	+	++	Comp.	Total
1833	(Number..... {Percent.....	0 0	0 20.0	8 80.0	0 0	0 0	0 0	10 100	0 0	2 4.7	16 37.5	22 51.5	1 2.5	2 4.7	43 100
	(Number..... {Percent.....	2 8.0	8 32.0	10 40.0	0 0	3 12.0	25 100	6 6.8	9 10.2	27 30.7	38 43.3	2 2.5	6 6.8	88 100	
1834	(Number..... {Percent.....	0 0	5 29.4	8 47.1	3 17.6	0 0	17 100	6 3.2	14 7.6	50 31.9	90 48.6	12 6.6	4 2.2	155 100	
	(Number..... {Percent.....	0 0	4 14.5	22 78.6	2 7.1	0 0	28 100	7 2.6	27 9.9	73 26.7	144 52.8	20 7.5	2 0.7	273 100	
March.	(Number..... {Percent.....	0 0	3 30.0	6 60.0	1 10.0	0 0	10 100	6 3.1	22 11.8	68 34.7	85 43.4	14 7.1	1 0.6	106 100	
	(Number..... {Percent.....	1 2.6	12 50.0	22 66.0	3 7.6	1 2.6	40 100	15 5.4	14 5.1	128 46.2	100 36.1	16 6.8	4 1.4	277 100	
April	(Number..... {Percent.....	2 3.8	0 0	18 54.0	4 7.6	3 6.7	53 100	28 8.6	30 9.3	160 49.4	88 27.2	11 5.4	7 2.9	324 100	
	(Number..... {Percent.....	0 0	5 16.6	10 31.2	11 34.5	6 18.8	32 100	14 4.3	103 56.1	99 33.7	57 19.4	16 5.4	5 1.7	294 100	
June.	(Number..... {Percent.....	0 0	0 0	3 60.0	1 20.0	0 0	5 100	13 8.9	52 56.6	45 30.8	26 17.8	6 4.1	4 2.7	146 100	
	(Number..... {Percent.....	0 0	0 0	3 27.3	8 72.7	0 0	11 100	3 3.9	6 7.8	24 51.5	38 49.4	5 6.6	1 1.3	77 100	
August.	(Number..... {Percent.....	5 2.2	9 3.9	74 32.0	116 50.1	20 8.7	7 3.0	231 100	98 5.1	279 14.7	699 36.7	688 36.1	103 5.4	36 1.9	1,903 100
	Total.....														

- = Negative. C = Congestion. ± = Slight encephalitis. + = Moderate encephalitis. ++ = Marked encephalitis. Comp. = Complications without encephalitis. Percentages are in italics, and read laterally.

ficial variation of the environmental temperature. In the course of these experiments, animals on the same diet, simultaneously inoculated with the same materials, were kept in the incubator at a mean daily temperature of 35° C., in the cold at a mean temperature of 10° C., in a moist chamber at room temperature, and under the ordinary room-temperature conditions in a heated building in winter and early spring (mean temperature about 23° C.). The brains of 128 animals were studied, 58 from the high temperature group, 7 part time at 23° C. and part at 35° C., 14 each from the cold and moist groups, and 38 from the control room-temperature group.

The results are presented in table 4. This table shows that animals kept at 35° C. present less marked brain reactions than room temperature (23° C.) controls, while those kept in the cold (10° C.) show more marked reactions (fig. 4).

TABLE 4.—Effect of temperature and humidity on brain reaction to St. Louis encephalitis virus in mice

Temperature	No.	—	C	±	+	++	Comp.	Total	Dosage MFD	Remarks
Hot (35° C.)	D 117		1	1	1			3		
	D 133	3	8	3	2			16	1, 5, 50	Compare with D 134, 5, 6.
	D 152	3		8	4			15	1, 5, 30	Compare with D 150, 1.
	D 198	3		2			1	6	1+	See D 198 below.
	D 164	6	4					10	100	See D 164 below.
	D 193			8				8	100+	See D 193 below.
Total		15	13	22	7		1	58		
Percent		25.9	22.4	37.9	12.1		1.7	100		
Moist (23° C.)	D 136	1	2	3	2			8	1, 5, 50	Compare with D 133, 4, 5.
	D 150			4	2			6	30	Compare with D 151, 2.
	Total	1	2	7	4			14		
Percent		7	14	50	29			100		
Cold (10° C.)	D 134			3	11			14	1, 5, 50	Compare with D 133, 5, 6.
Percent				21	79			100		
Room (23° C.)	D 135		4	6	5			15	1, 5, 50	Compare with D 133, 4, 6.
	D 151		2	3	1	1		7	5-30	Compare with D 150, 2.
	D 193			1	2			3	1, 5, 30	See D 193, 198, above.
	D 198									
	D 164			6	4			10	100	See D 164 below.
	Total	0	6	16	12	1		35		Compare with D 166.
Percent		0	17.1	45.7	34.3	2.9		100		
23°-35° C. part time, corresponding hundreds in the serum virus test at room temperatures.	(D 166	1	4	1	1			7	100	Compare with D 164.
	D 133-6	3	8	28	56	4	1	100		
	D 150-2	2	11	32	47	7	1	100		
	D 164-6	2	11	39	41	7		100		
	D 193	3	7	37	41	8	4	100		
	D 198	7	6	49	35	3		100		
Average		3.4	8.6	37.0	44.0	5.8	1.2	100		

This experiment would appear to indicate that the observed seasonal variation in the distribution of brain reactions of various intensities is a direct environmental temperature effect, as the several

groups were simultaneously inoculated with similar doses and received the same diet.

ENDEMIC TYPHUS IN GUINEA PIGS

These results in the study of the St. Louis encephalitis in mice suggested that possibly a similar effect might be observed in endemic typhus in guinea pigs. Accordingly, the endemic typhus material used in our recent study on typhus and spotted fever (Lillie and Dyer 1936) was arranged according to month of death. This material was accumulated, over a period of several years, from various strains of endemic typhus, and in several months the number of animals was quite small. The guinea pigs killed before the 9th and after the 13th day of fever were excluded, restricting the material used to the peak period of the reaction, 9 to 13 days from onset of fever. Lesions were enumerated, as described in our previous paper (1936), from the same series of 5 standard cross sections from frontal cortex and corpora striata; thalamus, temporal and parietal cortex and hippocampus at the border of the optic radiation; midbrain through oculomotor roots and anterior colliculi; pons and cerebellum through brachia pontis; and enlargement of medulla.

The preliminary grouping by months is shown in table 5. This grouping showed high average numbers of lesions from October to April, and low numbers from May to September.

TABLE 5.—Average number of focal lesions counted in 5 standard cross sections of the brain of guinea pigs in endemic typhus, by months. Preliminary tabulation

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number of guinea pigs..	11	40	15	4	24	7	2	7	16	8	12	31	177
Aggregate number of lesions.....	379	1,267	113	119	179	52	2	32	37	138	313	1,008	3,729
Average number of lesions.....	34.5	31.7	7.5	29.8	7.4	7.4	1.0	4.6	2.3	17.2	25.2	33.8	21.1

Encouraged by the result of this tabulation, but dissatisfied with the small number of animals in some months, we determined to examine at least 30 guinea pig brains each month for a full year. Approximately half of these animals were inoculated and carried through to the 9th to 12th day from febrile onset at the National Institute in Washington, D. C., the others at the branch laboratory in Mobile, Ala., by Dr. George D. Brigham.

During the year from February 1, 1936, to January 31, 1937, 515 guinea pig brains were collected, 226 in Washington and 289 in Mobile. The results of the individual examinations are presented in figure 5, and the median lines for Washington and Mobile are drawn in. A seasonal variation was again shown in both series.

Figures 6 and 7 show a median average monthly number of lesions charted against the mean monthly temperatures for the respective cities. This median average was calculated by excluding the two-sixths of the animals showing, respectively, the highest and lowest numbers of lesions, and averaging the remaining middle two-thirds, in order to exclude the effect on an arithmetic average of the few extraordinarily high counts.

The mean monthly temperatures are naturally outdoor temperatures, and when these fell below 60° to 65° F. the effect of heating of buildings naturally came into effect, so that little difference is shown between the Washington and Mobile series from February to April,

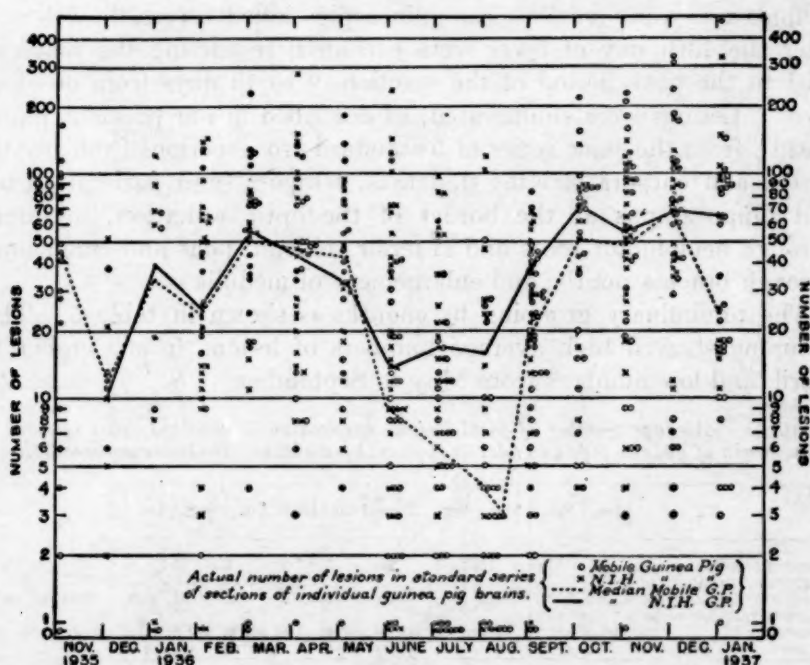


FIGURE 5.—Seasonal variation in the brain reaction of endemic typhus in guinea pigs in Mobile, Ala., and Washington, D. C.

and in November and December 1936. A noteworthy drop in the average number of lesions in the Mobile series in January 1937 was accompanied by a rise of the mean temperature from 54.2° to 63° F. It is to be further noted that the maximum mean temperatures of 73° to 78° F. in Washington were accompanied by lesion averages of 14 to 23, while mean temperatures around 82° F. in Mobile were accompanied by lesion counts averaging 4 to 10.

As in the St. Louis encephalitis in mice, a correlation with temperature appeared to be an important determining factor in the intensity of the endemic typhus reaction in the guinea pig brain.

To test further this hypothesis, three series of guinea pigs were inoculated in January 1937 with the same material at the same time,

and fed identical diets, the one maintained in a room heated to about 33°C ., the second series in a room kept about 18°C ., and the third at room temperature, about 24°C . The animals were acclimated to the temperatures prevailing in the respective rooms for a period of 3 weeks before inoculation, and kept there until killed on the 11th day from onset of fever. The results are presented in table 6.

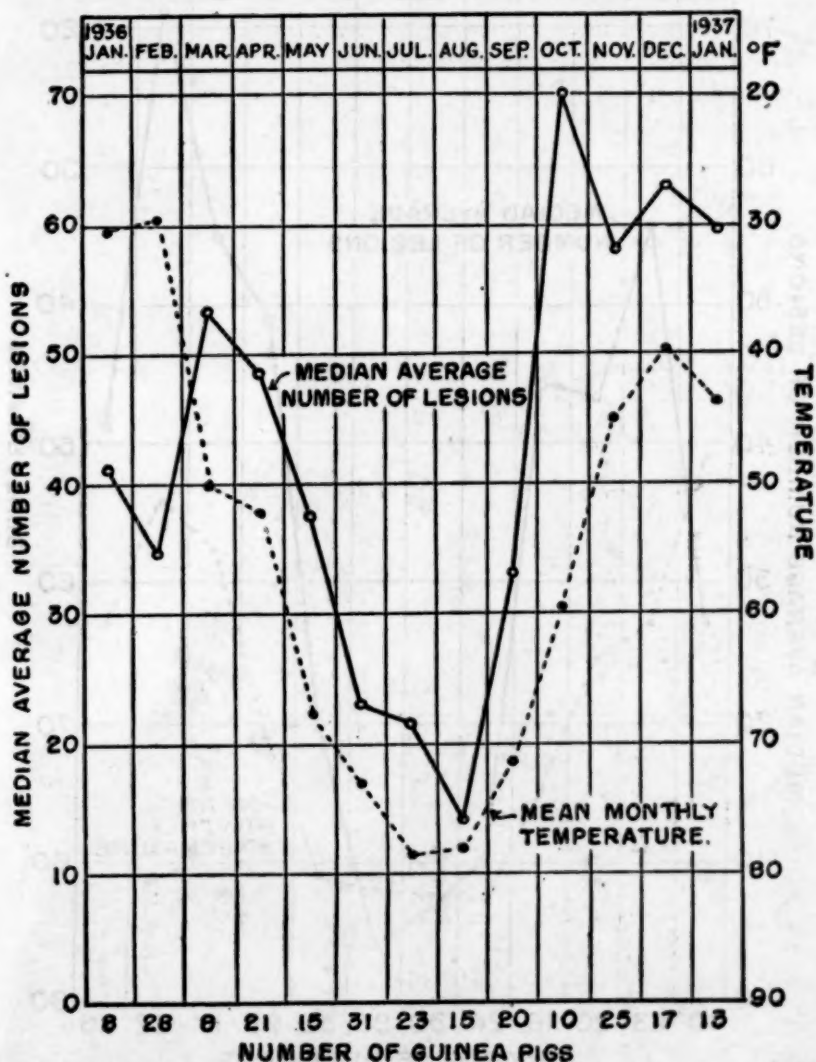


FIGURE 6.—Brain reaction in endemic typhus in guinea pigs and the mean monthly temperature (inverted) in Washington, D. C.

The averages were all higher than had been expected, and those for room temperature were higher than any monthly average that we had obtained. In searching for an explanation it was recalled that previous work (Lillie and Dyer 1936) had shown that the inoculum used in this experiment, testicular washings, had produced consistently

more marked average reactions than had blood, the other commonly used inoculum. Segregation of the series run from February 1, 1936, to January 31, 1937, according to the type of inoculum, showed that in several months the guinea pigs inoculated with testicular washings

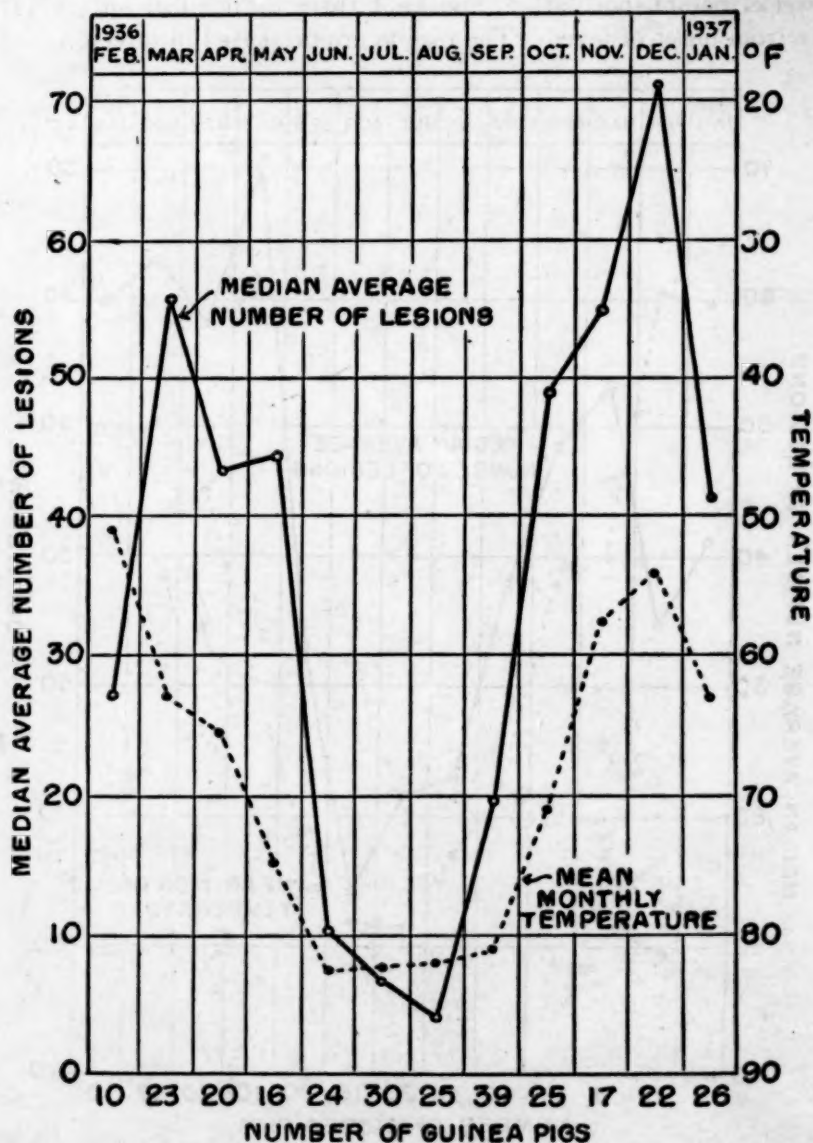


FIGURE 7.—Brain reaction in endemic typhus in guinea pigs and mean monthly temperature (inverted) in Mobile, Ala.

had shown as high average numbers of lesions as that encountered in the room temperature series of the artificial temperature experiment (fig. 8).

Returning to table 6, another unexpected finding was revealed, namely, that the 18° C. series showed a lower average number of

lesions than did the 24° C. group, but a higher median. If the median is the correct finding rather than the average, the results are consistent with the hypothesis of a direct temperature effect. If, on the other hand, the average, or the average of the middle two-thirds is the more nearly correct finding, a further explanation must be offered. Inasmuch as 15° C. to 18° C. is close to the minimum temperature at which we have been able to maintain guinea pigs without undue mortality from pneumonia, it is possible that the decreased average reaction may be an expression of decreased resistance in low environmental temperatures close to those at which guinea pigs are unable to survive.

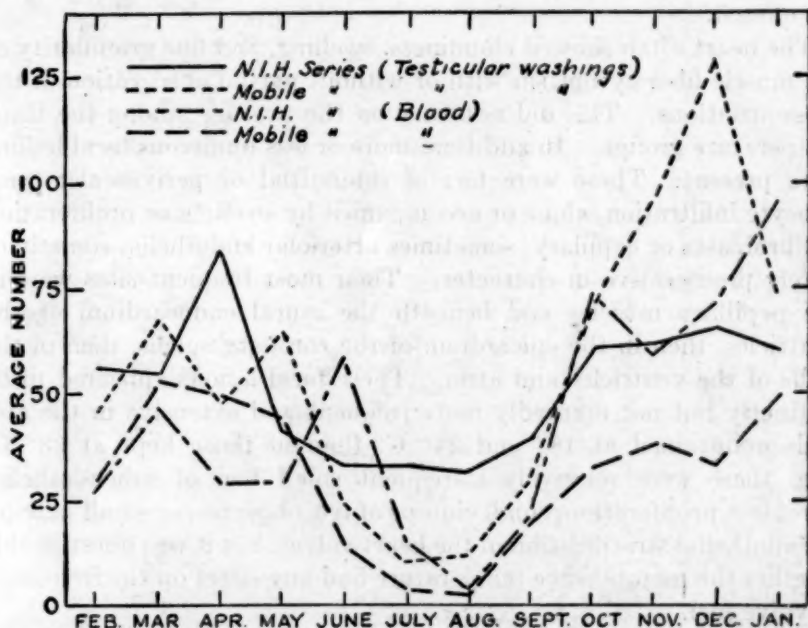


FIGURE 8.—Endemic typhus in guinea pigs. Average numbers of brain lesions by months, and by inoculation place.

TABLE 6.—The effect of artificially controlled environmental temperature on the brain reaction of endemic typhus in guinea pigs

Temperature of room (° C)	Number of guinea pigs	Average number of lesions per guinea pig	Extremes		Median number of lesions per guinea pig	Average number of lesions in median two-thirds of animals
			Low	High		
33.....	16	57.9	0	167	39.5	50.4
24.....	18	90.7	13	284	45	75.9
18.....	15	70.5	20	162	76	67.7

A further noteworthy finding in table 6 is that the average and median are notably higher for the 33° C. group than for any monthly

group of guinea pigs inoculated with testicular washings and killed during June, July, or August either in Washington or in Mobile. We are not able to explain this discrepancy at the present writing.

In an effort to reach some further correlations, detailed studies of the visceral pathology were made in this same series of 49 guinea pigs maintained under artificial temperature conditions, and crude quantitative estimates of the grade of reaction in each organ were made. The lesions were graded as to number and size as slight (\pm), moderate, (+), marked (++) and very marked (+++). As we have not previously presented data concerning the visceral reaction in endemic typhus in guinea pigs the following brief description and correlation are offered.

The heart often showed cloudiness, swelling, and fine granularity of the muscle fiber cytoplasm with or without partial obscuration of the cross striations. This did not vary on the average among the three temperature groups. In addition, more or less numerous focal lesions were present. These were foci of interstitial or perivascular lymphocyte infiltration, alone or accompanied by swelling or proliferation of fibroblasts or capillary, sometimes arteriolar endothelia, sometimes purely proliferative in character. Their most frequent sites were in the papillary muscles and beneath the mural endocardium of the ventricles, then in the epicardium of the coronary sulcus, then in the walls of the ventricles and atria. These focal lesions appeared to be distinctly but not markedly more frequent and extensive in the animals maintained at 18° and 24° C. than in those kept at 33° C. Also there were relatively infrequent small foci of subendothelial fibroblast proliferation, small clumps of lymphocytes, or small patches of endothelial stratification in the heart valves, but it was questionable whether the maintenance temperature had any effect on the frequency of valve foci.

In the lung, small patches of atelectasis and carnifying or resolving pneumonia were encountered in all three groups in not significantly different frequency, which, in view of the frequency of such lesions in guinea pigs used in various other studies, are probably to be disregarded. Perivascular lymphocyte infiltration was almost constant, and often went on to the formation of lymphoid follicles with germinal centers containing often swollen phagocytic reticulum cells with ingested pyknotic nuclear fragments. While the frequency of the perivascular lymphocyte infiltration was similar in the three groups, follicle formation was over three times as frequent in the 18° and 24° C. groups as in the 33° C. group.

In the tracheobronchial lymph nodes, germinal centers were quite regularly present. Swollen intrafollicular reticulum cells with variable amounts of phagocytosed nuclear debris were often present, and this reaction was distinctly more pronounced in the 18° and 24° C. groups

than in the 33° C. group. Pulp reticulum cell swelling, edema, sinus reticuloendotheliosis, macrophage exudation, and other pulp and sinus reactions were infrequent and present in not significantly different frequency in the several groups.

The spleen pulp commonly presented moderate swelling of the sinus reticuloendothelium with some inconstant exudation of macrophages and erythrophagia and a variable, inconstant, pulp congestion. Sometimes the pulp contained a few normoblasts or an occasional megakaryocyte, and in one animal some myelocytes as well as more numerous normoblasts and megakaryocytes. None of these conditions could be correlated with the temperature grouping. The presence of lymphoblastic germinal centers in the splenic follicles was somewhat, but possibly not significantly, more frequent in the 18° and 24° C. groups. Swelling of follicle reticulum cells with phagocytosis of nuclear fragments, and the presence of clumps of polymorphonuclear leucocytes in pulp and sinuses were significantly greater in the 18° and 24° C. groups than in the 33° C. group. The lack of change in sinus reticuloendothelial reaction in the different temperature groups disagrees with, and the increased karyorrhexis and phagocytic activity in the follicle centers in the lower temperature group directly contradicts, the findings of Huggins and Noonan regarding the increased phagocytosis of carbon in bone marrow of rats at higher temperatures. However, it is improbable that sinus reticuloendothelial phagocytic activity of marrow has the same significance as centrofollicular activity in the spleen and lymph nodes and follicles.

Other than an inconstant, usually slight, and probably not significant capillary congestion, the liver showed no lesions.

Clumps of lymphocytes were seen in the adrenal medulla in a minor number of animals in all three groups in not significantly different frequency or intensity. Similarly, foci of perivascular or interstitial lymphocyte infiltration or vascular adventitial or endothelial proliferation were seen in the renal cortex in most of the animals. Both the frequency and intensity of these focal lesions were greatest in the 33° C. group, while, conversely, the frequency and intensity of foci of lymphocyte infiltration of the renal pelvis was 2 and 3 times as great in the 24° and 18° C. groups compared with the 33° C. group.

Marrow from the vertebrae and the upper half of the tibia was studied. Red marrow was present in both locations in all animals. Fatty marrow was present below about the middle of the tibial diaphysis in a number of animals. Generally granular myelocytes were the predominant cell type, metamyelocytes and leucocytes were present in small to moderate numbers, and moderate numbers of normoblasts were identified. Maturation of leucocytes and erythropoiesis seemed slightly more active in the 18° C. than in the 24° or 33° C. groups. Megakaryocytes were distinctly more numer-

ous in the 18° and 24° C. groups. These mature guinea pigs failed to show the hemopoietic response in the tibial marrow to temperature variations which was expected from the experiments of Huggins and Blacksom with white rats.

Pronounced reactions in one organ were often not associated with pronounced reactions in other organs or in the brain in the same animal. When the animals were grouped in four groups according to the intensity of the brain reaction, the highest average visceral

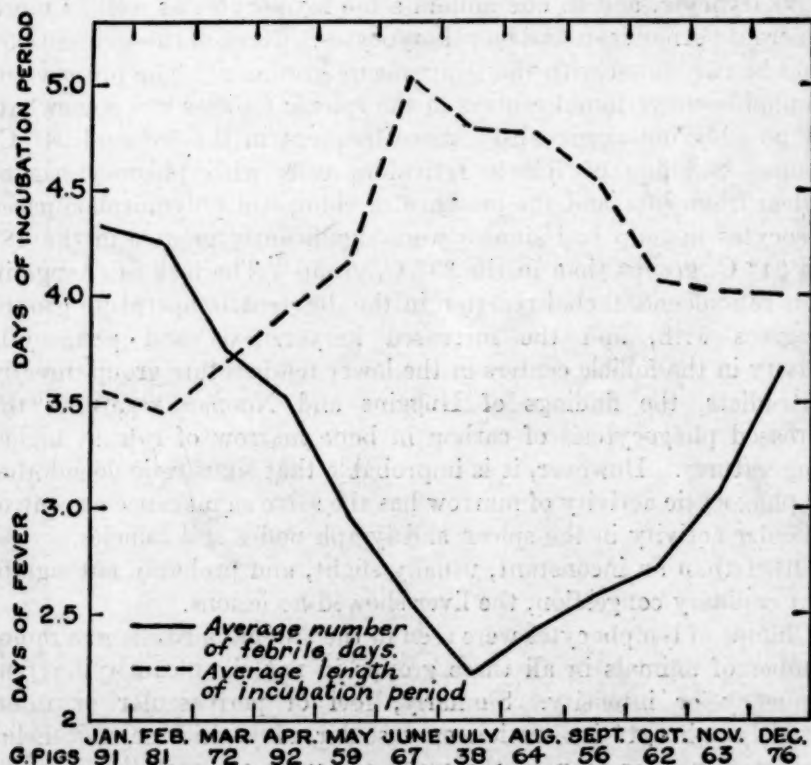


FIGURE 9.—Endemic typhus, seasonal variation in average number of days of fever (above 39.6° C.) and in average length of incubation period in guinea pigs inoculated with testicular washings, 1929-30.

reactions were found in the two groups showing the least and greatest numbers of brain lesions.

However, when the average visceral reactions are segregated according to the temperature grouping, the 33° C. group shows a definitely less marked average visceral reaction than the other two groups, thus agreeing with the brain reaction. Hence, the lesser intensity of the brain reaction in higher environmental temperatures cannot be ascribed to any compensatorily greater visceral reaction.

Following an impression that clinical reactions in endemic typhus in guinea pigs were more pronounced in the winter months, the individual records of all guinea pigs inoculated with the Wilmington

strain from October 1929 to September 1936 were examined and a compilation was made of all uncomplicated attacks in which the animals were allowed to recover. The number of days on which the rectal temperature was 39.6°C ., or higher, and the incubation period were recorded for each animal and averages were calculated for each month, assigning each animal to the month in which the inoculation was made.

It was found that the average number of febrile days was greatest during the winter months and least in the summer and that the

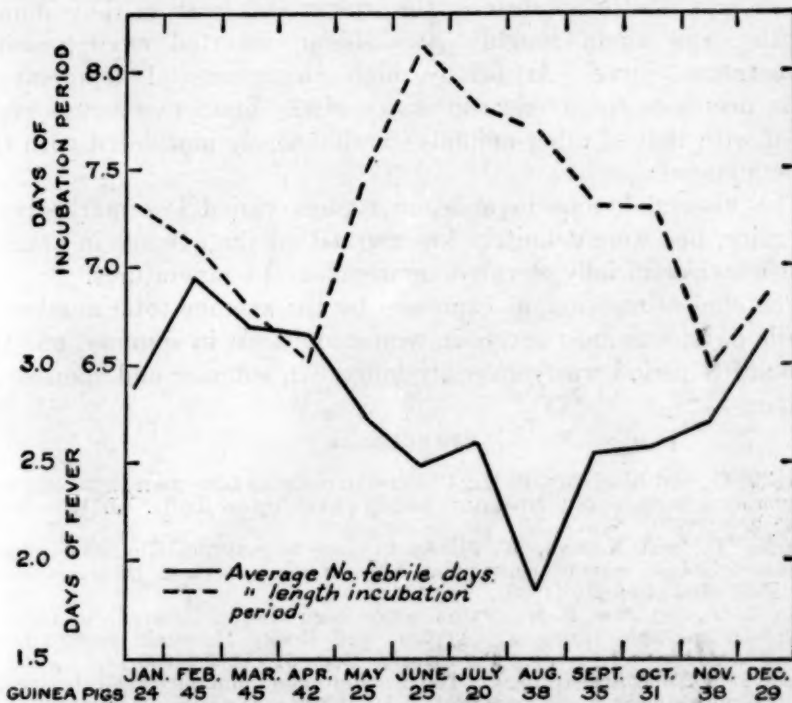


FIGURE 10.—Endemic typhus, seasonal variation in average number of days of fever (above 39.6°C .) and in average length of incubation period in guinea pigs inoculated with blood, 1929-30.

incubation periods were, conversely, longest in summer and shortest in winter. These results are shown in figures 9 and 10 for testicular washings and blood inocula, respectively. Maximum numbers of febrile days were recorded in January at 4.3 for testicular washings and in February at 3.4 for blood, and minima in July at 2.2 and August at 1.8, respectively. Incubation periods were longest in June, 5.0 and 8.1 days for testicular washings and blood inocula, respectively, shortest in February with testicular washings (3.5 days) and in April and November (6.5 days) with blood.

SUMMARY

The average intensity of the brain reaction of the St. Louis encephalitis in mice is greatest during the winter months and least in the summer, and roughly parallels an inverted environmental temperature curve. Artificially high environmental temperature decreases and low temperature increases the average intensity of the brain reaction in mice simultaneously inoculated with the same material.

The average intensity of the brain reaction of endemic typhus in guinea pigs is also greatest in the winter and least in the summer months, and again roughly parallels an inverted environmental temperature curve. Artificially high environmental temperature again decreases the average intensity of the brain reaction as compared with that of other animals simultaneously inoculated with the same material.

The visceral lesions in endemic typhus varied less markedly in intensity, but were definitely less marked on the average in animals kept under artificially elevated environmental temperatures.

The clinical reaction, as expressed by the average total number of febrile days, was most severe in winter and least in summer, and the incubation period was conversely longest in summer and shortest in winter.

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CITY HEALTH OFFICERS, 1937

Directory of Those in Cities of 10,000 or More Population

Directories of the city health officers in the cities of the United States having populations of 10,000 or more have been published in the Public Health Reports and reprinted as separates¹ for each year from 1916 to 1936, except 1932 and 1935, for the information of health officers and others interested in public health activities. These direc-

¹ Reprints Nos. 346, 416, 494, 539, 599, 702, 767, 876, 930, 1025, 1103, 1177, 1257, 1333, 1426, 1521, 1613, 1685, and 1783, from the Public Health Reports.

tories have been compiled from data furnished by the health officers. The cities included in this directory are those having populations of 10,000 or more according to the 1930 census.

The asterisk (*) indicates that the officer before whose name it appears has been reported to be a "whole-time" health officer. For this purpose a "whole-time" officer is defined as "one who does not engage in the practice of medicine or in any other business, but devotes all his time to official duties."

City	Name of health officer	Official title
Alabama:		
Anniston.....		
Bessemer.....	*J. D. Dowling, M. D.	County health officer.
Birmingham.....	*Judson D. Dowling, M. D.	Do.
Decatur.....	*Lee Roy Murphree, M. D., C. P. H.	Do.
Dothan.....	*W. T. Burkett, M. D.	Do.
Fairfield.....	*J. T. Duncan	Health and sanitary inspector.
Florence.....	*G. E. Newton, M. D.	County health officer.
Gadsden.....	*C. L. Murphree, M. D.	Do.
Huntsville.....	*W. C. Hatchett, M. D.	Do.
Mobile.....	*O. L. Chason, M. D., Dr. P. H.	Do.
Montgomery.....	*J. L. Bowman, M. D.	Do.
Phenix City.....	*Marion L. Shaddix, M. D.	Do.
Selma.....	*L. T. Lee, M. D.	Do.
Tuscaloosa.....	*A. A. Kirk, B. S. in Commerce, M. D.	Do.
Arizona:		
Phoenix.....		
Tucson.....	*Lewis H. Howard, M. D.	Director, Pima County health service.
Arkansas:		
Blytheville.....	C. E. Wilson, M. D.	City health officer.
El Dorado.....	F. O. Mahony, M. D.	Do.
Fort Smith.....	*James E. Johnson, M. D.	District health officer.
Hot Springs.....	*J. F. Merritt, M. D.	City and county health officer.
Jonesboro.....	R. C. Shanlever, Ph. G., M. D.	Chairman, board of health.
Little Rock.....	*Thomas M. Fly, M. D.	City health officer.
North Little Rock.....	W. M. Burns, M. D.	Health officer.
Pine Bluff.....	*Walter Hugh Bruce, M. D.	Director, county health department.
Texarkana.....		
California:		
Alameda.....	Leonard E. Skilling, M. D.	Health officer and city physician.
Alhambra ¹	*S. J. Stewart, M. D.	District health officer.
Anaheim.....	*K. H. Sutherland, M. D.	County health officer.
Bakersfield.....	Peter J. Cuneo, L.L. B., M. D.	City health officer.
Berkeley.....	*Frank L. Kelly, M. D., Dr. P. H.	Health officer and local registrar.
Beverly Hills.....	Harry Hoagland Blodgett, M. D.	City health officer.
Brawley.....	John L. Parker, M. D.	Do.
Burbank ¹	T. H. Ransom, M. D.	District health officer.
Burlingame.....	M. F. Desmond, M. D.	Health officer.
Compton ¹	*F. E. Estes, M. D.	District health officer.
Eureka.....	William J. Quinn, M. D.	Health officer.
Fresno.....	Carlton Mathewson, M. D.	City health officer.
Fullerton.....	*Kenneth H. Sutherland, M. D.	County health officer.
Glendale ¹	*F. A. Wilmot, M. D., D. P. H.	District health officer.
Huntington Park ¹	*G. M. Malkin, M. D.	Do.
Inglewood ¹	*J. W. Robinson, M. D.	Do.
Long Beach.....	*G. E. McDonald, M. D.	City health officer.
Los Angeles.....	*George Parrish, M. D.	Health officer.
	*George M. Stevens, M. D.	Epidemiologist and first assistant health officer.
	*G. F. Schmelzel, M. D.	Chief deputy health officer.
	*A. L. Peterson	Executive assistant.
	Division directors:	
	*Charles F. Kiley.....	Chief accountant.
	*J. L. Lanigan.....	Secretary to health board.
	*Harry Cohn, M. D.....	Director of tuberculosis.
	*Agnes M. Talcott.....	Director of nurses.
	*F. W. Peterson.....	Director of vital statistics.
	*John Carman.....	Chief chemist.
	Mona Bettin, M. D.....	Chief bacteriologist.
	*Morris S. Siegel.....	Director of housing and sanitation.
	*L. G. Clark, D. V. M.....	Director of milk and meat inspection.
	*H. Manning Elliott, M. D.....	Director of venereal clinic (male).
	*Lola Pedlow, M. D.....	Director of venereal clinic (female).
	Lyle McNellie, M. D.....	Director, maternity division.
	*C. K. Stewart.....	Director of rodent division.

¹ Under supervision of Dr. J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
California—Continued		
Los Angeles—Contd.	*J. M. Cain.....	Director of quarantine and morbidity division.
	*L. V. Dieter, D. Phar.....	Director of laboratories.
	*Lillian Kositz, M. D.....	Director, child hygiene division.
Modesto.....	*E. F. Reamer, M. D.....	County health officer.
Monrovia ¹	J. M. Furstman, M. D.....	District health officer.
Oakland.....	*N. N. Ashley, M. D.....	Health officer.
Ontario.....	Calvert L. Emmons, M. D.....	City health officer.
Palo Alto.....	*Louis Olsen, S. E.....	Health officer.
Pasadena.....	*Wilton L. Halverson, M. D., Dr. P. H.....	Do.
Pomona ¹	*M. U. Stoneman, M. D.....	District health officer.
Redlands.....	Frank H. Folkins, M. D.....	City health officer.
Richmond.....	Charles R. Blake, M. D.....	Commissioner of health.
Riverside.....	*W. A. Jones, M. D.....	Do.
Sacramento.....	*Herbert F. True, M. D.....	City health officer.
Salinas.....	*Mrs. Marie Fidel Whiteley, P. H. N.....	Do.
San Bernardino.....	G. Stirling Landon, M. D.....	Do.
San Diego.....	*Alex M. Lesem, M. D.....	Director of health.
San Francisco:	Health Advisory board:	
Department of public health.	J. W. Ward, M. D., Chairman.....	
	T. J. Lenehan.....	
	Lawrence Arnstein.....	
	Frank J. Klimm.....	
	Frank H. McKeivitt, D. D. S.....	
	Langley Porter, M. D.....	
	W. C. Voorsanger, M. D.....	
	Consultants:	
	P. J. Hanzlik, M. D.....	
	C. G. Hyde, C. E.....	
	C. D. Leake, Ph. D.....	
	M. S. Marshall, Ph. D.....	
	K. F. Meyer, Ph. D.....	
	A. C. Reed, M. D.....	
	Alanson Weeks, M. D.....	
	Executive staff:	
	*J. C. Geiger, M. D.....	Director of public health.
	*C. M. Woolenberg, Ph. G.....	Director of institutions and superintendent, Laguna Honda Home.
	*L. M. Wilbor, M. D.....	Superintendent, San Francisco Hospital.
	*W. C. Vanderverter, M. D.....	Acting medical superintendent Hassler health home.
	Edmund Butler, M. D.....	Chief surgeon, emergency hospital service.
	*J. I. O'Dea.....	Chief steward, emergency hospital service.
	George H. Becker, M. D.....	Director, bureau of communicable diseases.
	R. W. Burlingame, M. D.....	Resident physician, isolation division, San Francisco Hospital, and chief, division of venereal disease control.
	*P. S. Barrett, M. D.....	Director, bureau of child hygiene.
	*Ernestine Schwab.....	Director, division of field nursing.
	Olga Bridgman, M. D.....	Chief, division of mental hygiene.
	Robert Grosso, D. D. S.....	Chief, division of dental hygiene.
	*T. P. Lydon.....	Director, bureau of food and milk.
	*J. J. Burke.....	Chief, food and restaurant inspection.
	*R. Q. Engle.....	Chief, pasteurizing plant inspection.
	*C. G. Hansen.....	Chief, meat and market inspection.
	*F. W. Orme, D. V. M.....	Chief, abattoir inspection.
	*A. B. Crowley.....	Chief, industrial hygiene.
	*H. P. Thyle.....	Chief, housing inspection.
	*W. D. Hobro.....	Chief, plumbing inspection.
	*Kathryn B. Walker, M. D.....	Bacteriologist-in-charge, division of bacteriology-serology.
	*Clinton G. Davis.....	Senior chemist, division of chemistry.
	*P. R. Hennessy.....	Senior accountant.
	*R. C. Miller.....	Vital statistician.
	*Henry C. Brown, M. D.....	City health officer.
	*Joseph P. Rose.....	Food inspector.
	*James A. Warburton, M. D.....	City health officer.
	*Kenneth H. Sutherland, M. D.....	County health officer.
	*Clarence T. Roome, M. D.....	Health officer.
	*Mahlon D. McPherson, M. D.....	City health officer.
	*W. F. Reasner, M. D.....	District health officer.
	*E. J. Helgren, B. S. in chemistry; Dr. B.....	Health officer.
	*G. M. Malkin, M. D.....	District health officer.
	*Darius Eshoo, Ph. B., M. D.....	City health officer.
	*John J. Sippy, M. D.....	District health officer.
San Jose.....		
San Leandro.....		
San Mateo.....		
Santa Ana.....		
Santa Barbara.....		
Santa Cruz.....		
Santa Monica ¹		
Santa Rosa.....		
South Gate ¹		
South Pasadena.....		
Stockton.....		

¹ Under supervision of Dr. J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
California—Continued		
Vallejo	*E. A. Peterson, M. D.	Health officer.
Ventura	*Charles R. Wylie, M. D.	County health officer.
Whittier ¹	*R. L. Kaufman, M. D.	District health officer.
Colorado:		
Boulder	*H. L. Morency, Ph. B., D. V. M.	Director of public health.
Colorado Springs	Omer R. Gillett, Ph. B., M. D.	Health officer.
Denver	*Theodore L. Williams, M. D.	Deputy manager of health and charity.
Fort Collins	T. C. Taylor, M. D.	Health officer.
Grand Junction	E. H. Munro, M. D.	City physician.
Greeley	Leo L. Lux, M. D.	Do.
Pueblo	*W. E. Buck, M. D.	Chief, department of health, sanitation and inspection.
Trinidad	W. L. Newburn, M. D.	City physician.
Connecticut:		
Ansonia		
Bridgeport	*Richard O'Brien Shea, M. D.	Health officer and registrar.
Bristol	Benjamin B. Robbins, M. D.	City health officer.
Danbury	Felix F. Tomalno, M. D.	Do.
Derby	Thomas F. Plunkett, M. D.	Do.
East Hartford	F. W. Brecker, M. D.	Do.
Enfield	Frank F. Simonton, M. D.	Health officer.
Fairfield	Edward P. Kemp, M. D.	Do.
Groton	Frank W. Hewes, M. D.	Do.
Hamden	George H. Joslin, M. D., D. P. H.	Do.
Hartford	*Benjamin G. Horning, M. D., C. P. H.	Do.
Manchester	D. C. Y. Moore, M. D.	Chairman, board of health.
Meriden	Michael J. Sullivan, M. D.	Health officer.
Middletown	*M. L. Palmieri, M. D., M. P. H.	Do.
Millford	C. K. Heady, M. D.	Do.
Naugatuck		
New Britain	*Louis J. Dumont, M. D.	Do.
New Haven	*Joseph I. Linde, M. D.	Do.
New London	*Benjamin N. Pennell, D. V. S.	Do.
Norwalk	Robert E. Perdue, M. D.	Do.
Norwich	Harrison Gray, M. D.	Do.
Shelton	Francis I. Nettleton, Ph. B., M. D.	Health commissioner.
Stamford	*Raymond D. Fear, M. D., Dr. P. H.	Do.
Stonington		
Stratford	Harold T. Oesau, M. D.	Health officer.
Torrington		
Wallingford	Edward J. Godfrey, M. D.	Do.
Waterbury	*Harry B. Smith, M. D., M. P. H.	Director of health.
West Hartford	Charles E. Kaufman, Ph. B., M. D.	Health officer.
West Haven	N. Spector, M. D.	City health officer.
Willimantic		
Delaware:		
Wilmington	Roger Murray, M. D.	Executive secretary, board of health.
District of Columbia:		
Washington		
Bureau of preventable diseases.	*George C. Ruhland, M. D.	Health officer.
Medical inspection of schools.	*Daniel L. Seckinger, M. D.	Assistant health officer.
Food inspection.	*Arthur G. Cole	Chief clerk and deputy health officer.
Sanitary inspection.	*James G. Cumming, M. D.	Director.
Vital statistics.	*Joseph A. Murphy, M. D.	Do.
Chemical laboratory.	*Reid R. Ashworth, D. V. S.	Do.
Bacteriological laboratory.	*J. Frank Butts, LL. B.	Do.
Serological laboratory.	*Joseph B. Irvine	Do.
Child welfare and hygiene service.	*John B. Reed	Do.
Tuberculosis.	*John E. Noble	Do.
Nursing.	*Jesse P. Porch, D. V. M.	Do.
Maternity welfare.	*Hugh J. Davis, M. D.	Do.
Maternal and child welfare.	A. Barklie Coulter, M. D.	Do.
Public health instruction.	*Mrs. Josephine Pittman Prescott	Do.
Public health engineering.	J. Bay Jacobs, M. D.	Medical director.
Florida:	*Ella Oppenheimer, M. D.	Director.
Daytona Beach	*Melvin P. Iseminger, M. D.	Do.
Gainesville	*Claud F. Browning	Consultant.
Jacksonville		
Key West	*Simon Reed	Health officer.
Lakeland	W. Lassiter, M. D.	City health officer.
Miami	*N. A. Upchurch, M. D.	Do.
	William R. Warren, M. D.	Do.
	*George N. MacDonell, M. D.	Director of public health.

¹ Under supervision of Dr. J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
Florida—Continued		
Orlando.....	Claude Anderson, M. D.....	City health officer.
Pensacola.....	*William H. Pickett, M. D., C. P. H.....	Director, county health department.
St. Augustine.....	Herbert E. White, M. D.....	City health officer.
St. Petersburg.....	*Frederick F. Kumm, M. D.....	Do.
Sanford.....	J. N. Tolar, M. D.....	City physician.
Tallahassee.....	*Leander Johnson Graves, M. D.....	Director, county health unit.
Tampa.....	*James R. McEachern, M. D.....	City health officer.
West Palm Beach.....	W. E. Van Lanningham, M. D.....	City health officer and city physician.
Georgia:		
Albany.....	*Thomas W. Collier, M. D.....	Commissioner of health.
Athens.....	*Wedford W. Brown, M. D.....	Do.
Atlanta.....	*John P. Kennedy, M. D.....	City health officer.
Augusta.....	*Thomas B. Phinizy, M. D.....	Commissioner of health.
Brunswick.....	*Millard E. Winchester, M. D., Dr. P. H.....	Do.
Columbus.....	William E. Mayher, M. D.....	City health officer.
Decatur.....		
Griffin.....	*Thomas O. Vinson, M. D.....	Commissioner of health
Lagrange.....	*S. C. Rutland, M. D.....	County health officer.
Macon.....	*J. D. Applewhite, M. D., M. P. H.....	Health officer.
Rome.....	*B. V. Elmore, P. H. G., M. D.....	County commissioner of health.
Savannah.....	*Victor H. Bassett, M. D.....	City health officer.
Thomasville.....	J. R. Dykes, M. D.....	County health officer.
Valdosta.....	*Gordon T. Crosier, M. D., D. P. H.....	City health officer.
Waycross.....	*George E. Atwood, M. D., D. P. H.....	Commissioner of health.
Idaho:		
Boise.....	*Rowland C. Taylor, LL. B.....	Health officer.
Pocatello.....		
Illinois:		
Alton.....	C. C. Potter, M. D.....	Health commissioner.
Aurora.....	Arnold S. Benson, M. D.....	Do.
Belleville.....	*George F. Schilling.....	Health officer.
Berwyn.....	*E. K. Preis, M. D.....	Health director.
Bloomington.....	Paul F. Klonka, M. D.....	Do.
Blue Island.....	A. J. Roemisch, M. D.....	Commissioner of health.
Brookfield.....		
Cairo.....	C. L. Weber, M. D.....	Health officer.
Calumet City.....	Andrew Nady, M. D.....	Health commissioner.
Canton.....	J. C. Simmons, M. D.....	City physician.
Centralia.....	G. N. Welch, M. D.....	Health officer.
Champaign.....	C. George Appelle, M. D.....	City health officer.
Chicago.....	*Herman N. Bundesen, M. D.....	President, board of health.
	Joel I. Connolly.....	Assistant to the president.
	Louis E. Schmidt, M. D.....	Secretary, board of health.
	Isaac D. Rawlings, M. D.....	Chief of bureau.
Bureau of communicable diseases.....		
Bureau of child welfare.....	Henry C. Niblack, M. D.....	Do.
Bureau of laboratories and research.....	John L. White, M. D.....	Do.
Bureau of dairy products, city division.....	Paul F. Krueger.....	Chief.
Bureau of dairy products, country division H.....	Henry C. Becker, M. D. V.....	Do.
Bureau of Administrative service.....	Henry L. Porsche.....	Chief clerk.
Epidemiology.....	Wm. I. Fishbein, M. D.....	Epidemiologist
Social hygiene division.....	George G. Taylor, M. D.....	Director.
Maternal and infant welfare.....	Edward J. Denenholz, M. D.....	Do.
Chicago Heights.....	Hugo Long, M. D.....	City physician.
Cicero.....	Frank J. Pokorney, Ph. G., M. D.....	Health commissioner.
Danville.....	C. M. Cook, M. D.....	Director of health.
Decatur.....	*P. A. Steele, M. D.....	Do.
East Moline.....	John Henry Fowler, M. D.....	Health officer.
East St. Louis.....	*Albert P. Lauman.....	Commissioner of public health.
Elgin.....	*A. L. Mann, M. D.....	Executive officer.
Elmhurst.....	Frank D. Leahy, M. D.....	President, board of health.
Elmwood Park.....	James A. Moxon, M. D.....	Health officer.
Evanston.....	*John W. H. Pollard, M. D.....	Commissioner of health.
Forest Park.....	George J. Baumgartner, M. D.....	Do.
Freeport.....	Howard J. Stickle, M. D.....	Health commissioner.
Galesburg.....	*F. M. Giddings.....	Health officer.
Granite City.....	*M. E. Kirkpatrick.....	Chairman, board of health.
Harrisburg.....	B. E. Montgomery, M. D.....	City physician.
Harvey.....	John W. Blair, M. D.....	Health officer.
Highland Park.....	Donald E. Rossiter, M. D.....	President, board of health.
Jacksonville.....	Friedrich Engelbach, M. D.....	City health warden.
Joliet.....	*E. J. Higgins, M. D.....	Commissioner of health.
Kankakee.....	*C. K. Smith, M. D.....	Health officer.
Kewanee.....	*L. H. Kopp.....	Sanitary inspector.

City	Name of health officer	Official title
Illinois—Continued		
La Grange	T. C. McDougal, M. D.	Health officer.
La Salle	Arlington Alles, M. D., C. P. H.	Health commissioner.
Lincoln	*George Seller	City health officer.
Mattoon	Lovell A. Neal, M. D.	Health commissioner.
Maywood	Charles M. Weinberg, M. D.	Do.
Melrose Park	Anthony P. Vincenti, B. Sc. in Chem., M. D.	Commissioner of health.
Moline	C. C. Ellis, M. D.	City physician.
Mount Vernon	C. O. Hamilton, M. D.	City health officer.
Oak Park	Frank S. Needham, M. D.	Commissioner of health.
Ottawa	E. P. Hatheway, M. D.	Health officer.
Park Ridge	Randolph F. Olmsted, M. D.	Commissioner of health.
Pekin	C. G. Muehlmann, M. D.	Health officer.
Peoria	Sumner M. Miller, M. D.	Commissioner of health.
Quincy	H. O. Collins, M. D.	Public health officer.
Rock Island	Edward B. de Silva, M. D.	City physician.
Rockford	*N. O. Gunderson, M. D.	Commissioner of health.
Springfield	H. H. Tuttle, M. D.	Superintendent of health.
Sterling		
Streator	T. K. Jennings, M. D.	President, board of health.
Urbana		
Waukegan	*Stanley J. Leckie	Health inspector.
West Frankfort	Wm. Thad Fife	City health officer.
Wilmette	Martin H. Seifert, Ph. G., M. D.	Health commissioner.
Winnetka	*Howard A. Orvis, M. D., M. S. in public health.	Health officer.
Indiana:		
Anderson	George B. Metcalf, M. D.	Health commissioner.
Bedford	*Charles Blackburn	City health commissioner.
Bloomington	Charles E. Holland, M. D.	Secretary, board of health.
Connorsville	Herman W. Smelser, M. D.	County health commissioner.
Crawfordsville	Fred N. Daugherty, M. D.	Secretary, board of health.
East Chicago	David R. Johns, M. D.	Do.
Elkhart	A. W. Kistner, M. D.	Do.
Elwood	W. Merle Hoppenrath, M. D.	Do.
Evansville	Thomas F. Reitz, M. D.	Do.
Fort Wayne	Karl C. Eberly, M. D.	Secretary and health commissioner.
Frankfort	Milton T. McCarty, M. D.	City health officer.
Gary	Beifield Atcheson, M. D.	Health commissioner.
Goshen	G. A. Whippy, M. D.	City health officer.
Hammond	H. C. Groman, Ph. B., M. D.	Secretary, board of health.
Huntington	R. F. Frost, M. D.	Do.
Indianapolis	*H. G. Morgan, M. D.	Health commissioner.
Jeffersonville	Sam Adair, M. D.	Secretary, board of health.
Kokomo	Will J. Martin, M. D.	Do.
La Fayette	Harry J. Laws, M. D.	Do.
La Porte	Jon Nelson Kelly, M. D.	Health officer.
Logansport	*Louis P. Denner	Health inspector.
Marion	G. R. Daniels, M. D.	Secretary, board of health.
Michigan City	N. R. Carlson, M. D.	Secretary and health officer.
Mishawaka	Francis W. Logan, M. D.	Secretary, board of health.
Muncie	Jules F. LaDuron, M. D.	Do.
New Albany	John P. Gentile, M. D.	Do.
Newcastle	Walter M. Stout, M. D.	Do.
Peru	F. M. Lynn, M. D.	Do.
Richmond	Charles J. Hufnagel, M. D.	Do.
Shelbyville	Paul R. Tindall, M. D.	Do.
South Bend	F. R. Nicholas Carter, M. D.	Executive secretary and health officer.
Terre Haute	Maurice B. Van Cleave, M. D.	Secretary, city board of health.
Vincennes	Norman E. Beckes, M. D.	Secretary, board of health.
Whiting	Jeremiah A. McCarthy, M. D.	Health commissioner.
Iowa:		
Ames	B. D. Atchley, M. D.	City health officer.
Boone	William Woodburn, M. D.	Health officer.
Burlington	*Edwin H. Place, M. D.	Director, county health unit.
Cedar Rapids	V. H. Hasek, M. D.	City physician.
Clinton	J. C. Burke, M. D.	City health physician.
Council Bluffs	J. M. Moskovitz, M. D.	Health officer.
Davenport	George Braunlich, M. D.	Do.
Des Moines	Harry E. Ransom, M. D.	City health commissioner.
Dubuque	Walter J. Connell, M. D., M. P. H.	Health director.
Fort Dodge	Thomas M. Riordan	Sanitary officer.
Fort Madison	Joseph M. Casey, M. D.	City physician.
Iowa City	E. W. Paulus, M. D.	Health officer.
Keokuk	Charles A. Dimond, M. D.	Physician, board of health.
Marshalltown	R. S. Grossman, M. D.	Health officer.
Mason City	C. M. Franchere, M. D.	City health director.
Muscatine	Rodney M. Arey, M. D.	Do.
Newton	E. A. McMurray, M. D.	City health physician.
Oskaloosa	Oscar J. DuBois, D. O.	City health officer.
Ottumwa		
Sioux City	*W. S. Petty, M. D.	Director, county health unit.
Waterloo	R. W. Driver, M. D.	Health officer.

City	Name of health officer	Official title
Kansas:		
Arkansas City	P. F. Theis, M. D.	City health officer.
Atchison	William K. Fast, M. D.	City and county health officer.
Chanute	James A. Butin, M. D.	City health officer.
Coffeyville	P. S. Townsend, M. D.	Do.
Dodge City	X. F. Alexander, M. D.	County health officer.
Eldorado	Mac Childs	Milk and dairy inspector.
Emporia	*C. H. Munger, M. D.	County health officer.
Fort Scott	Charles L. Mosley, M. D.	City health officer.
Hutchinson	Guy R. Walker, M. D.	City physician.
Independence	E. C. Wickersham, M. D.	City and county health officer.
Kansas City	*Wm. F. Lunsford, M. D., M. P. H.	City director of health.
Lawrence	James M. Mott, M. D.	Superintendent of public health.
Leavenworth	Alonzo R. Adams, M. D.	City physician.
Manhattan	Darrel L. Evans, M. D.	County health officer.
Newton	W. F. Schroeder, M. D.	Do.
Parsons	L. A. Proctor, M. D.	City health officer.
Pittsburg	W. G. Rinehart, Ph. G., M. D.	City physician.
Salina	Edgar M. Sutton, M. D.	County health officer.
Topeka	*C. B. Stephens, M. D.	City health officer.
Wichita	J. E. Wolfe, M. D.	Director of public welfare.
Kentucky:		
Ashland	*Robert Donald Higgins, M. D., M. P. H.	Director, county health department.
Bowling Green	*G. M. Wells, M. D.	Do.
Covington	Theodore Sallee, M. D.	City health officer.
Fort Thomas		
Frankfort	R. M. Coblin, M. D.	Do.
Henderson	*J. Leland Tanner, M. D., M. P. H.	Health officer.
Hopkinsville	Philip E. Haynes, M. D.	City health officer.
Lexington	*Charles M. Moore, M. D.	Do.
Louisville	*Hugh R. Leavell, M. D.	Director, city health department.
Newport	John Todd, M. D.	City health officer.
Owensboro	A. L. Kincheloe, M. D.	County health officer.
Paducah	*Russell E. Teague, M. D., C. P. H.	Do.
Louisiana:		
Alexandria	*R. B. Wallace, M. D.	City health officer.
Baton Rouge	T. Jeff McHugh, M. D.	Do.
Bogalusa	*J. H. Slaughter, M. D.	City physician.
Lafayette	G. A. Martin, M. D.	Do.
Lake Charles	H. B. White, M. D.	President, board of health.
Monroe		
New Orleans	James M. Batchelor, M. D.	Superintendent of public health.
Shreveport	*W. J. Sandidge, M. D., C. P. H.	Director, city-parish health department.
Maine:		
Auburn	*Shirley J. Davis, R. N.	Health officer.
Augusta	George A. Coombs, M. D.	City health officer.
Bangor	*Harry D. McNeil, M. D.	Health officer.
Bath	Joseph I. Smith, M. D.	Do.
Biddeford		
Lewiston	*Robert J. Wiseman, Jr., M. D.	Health officer.
Portland	*Thomas Tetreau, M. D.	Local health officer.
Sanford	*William H. Kelly, M. D.	Do.
South Portland		
Waterville	*Arthur R. Daviau, M. D.	Health officer.
Westbrook	Patrick H. Welch	Local health officer.
Maryland:		
Annapolis	*William J. French, M. D.	County health officer.
Baltimore:		
Administration	*Huntington Williams, M. D., Dr. F. H.	Commissioner of health.
	*William H. F. Warthen, M. D.	Assistant commissioner of health.
	*George W. Hemmeyer, M. D.	Health officer, western health district.
	John A. Skladowsky, M. D.	Health officer, southeastern health district.
	W. Thurber Fales	Director.
Bureau of vital statistics.		
Bureau of health information.	*Dorothy Yoe Kalben	Do.
Medical section:		
Bureau of communicable diseases.	*David H. Andrew, M. D.	Do.
Sydenham Hospital.	*Myron G. Tull, M. D.	Superintendent.
Bureau of tuberculosis.	*Phineas J. Sparer, M. D.	Director.
Bureau of venereal diseases.	*Ferdinand O. Reinhard, M. D.	Do.
Bureau of occupational diseases.	*John M. McDonald, M. D.	Do.
Bureau of child welfare.	*William K. Skilling, M. D.	Do.
Division of school hygiene	*H. Warren Buckler, M. D.	Chief.
Dental clinics	Morris Cramer, D. D. S.	Supervisor.
Laboratories	*C. Leroy Ewing	Director.

City	Name of health officer	Official title
Maryland—Continued		
Baltimore—Contd.		
Medical Section—Continued		
Public health nursing.	*Jane B. Laib, R. N.	Director.
Sanitary section.	*R. S. Craig	Do.
Bureau of milk control.	*Ivan M. Marty	Do.
Bureau of food control.	*Ferdinand A. Korff	Do.
Bureau of meat inspection.	*William Brenner, V. D.	Chief.
Bureau of environmental hygiene.	*William H. Schulze, Phar. D.	Director.
Cumberland.	*Joseph P. Franklin, M. D.	City health officer.
Frederick.	*E. C. Kefauver, M. D.	City and county health officer.
Hagerstown.	*W. R. Cameron, M. D., C. P. H.	Do.
Salisbury.	*S. H. Hurdle, M. D.	City health officer.
Massachusetts:		
Adams.	James F. McLaughlin, M. D.	Chairman, board of health.
Amesbury.	Clarence S. Morse	Agent, board of health.
Arlington.	*William H. Bradley	Do.
Athol.	Marion B. Sibley, M. D.	Secretary, board of health.
Attleboro.	Ralph P. Kent, M. D.	Health officer.
Belmont.	*Kebble B. Perine.	Agent, board of health.
Beverly.	*Alonzo O. Woodbury	Clerk and agent, board of health.
Boston.	*Henry F. R. Watts, M. D.	Health commissioner.
	*Joseph A. Cahalan.	Secretary.
Divisions:		
Medical.	*M. Victor Safford, M. D.	Deputy commissioner.
Communicable diseases.	*Frederick J. Bailey, M. D.	Do.
Bacteriological laboratory.	*Karl R. Bailey, M. D.	Do.
Food.	*P. H. Mullooney, D. V. M.	Do.
Child hygiene.	Charles F. Willinsky, M. D.	Do.
Sanitary.	*M. Victor Safford, M. D.	Acting deputy commissioner.
Tuberculosis.	*George O'Donnell, M. D.	Deputy commissioner.
Vital statistics.	*Joseph W. Monahan.	Do.
Braintree.	*John A. Hedlund	Health officer.
Brockton.	Charles D. McCann, M. D.	Do.
Brookline.	Francis Parkman Denny, M. D.	Do.
Cambridge.	Simon B. Kelleher, M. D.	Medical inspector.
Chelsea.	*John F. Welch	Health officer.
Chicopee.	*Paul G. Martel	Agent, board of health.
Clinton.	*Frederick E. Murphy	Health officer.
Danvers.		Do.
Dedham.	Thomas J. Brennan	Agent, board of health.
Easthampton.	Charles J. Hanson, M. D.	Do.
Everett.	*William F. Hogan	Secretary and executive officer.
Fairhaven.	*W. Fred Delano	Health commissioner.
Fall River.	*Ernest M. Morris, M. D., C. M.	Agent, board of health.
Fitchburg.	*Fred R. Brigham	Do.
Framingham.	*David Moxon, C. P. H.	Do.
Gardner.	*William P. O'Donnell	Health officer.
Gloucester.	*Patrick E. Curley	Health agent and milk inspector.
Greenfield.	*George P. Moore	Clerk and agent, board of health.
Haverhill.	*Frederick W. Morse	Agent and health officer.
Holyoke.	*Daniel P. Hartnett, Ph. G.	Clerk, board of health.
Lawrence.	*Daniel J. Costello	Agent and plumbing inspector.
Leominster.	*Hugh E. Crain	Director of health.
Lowell.	*John J. McNamara, S. E., M. D.	Commissioner of public health.
Lynn.	James A. Dumas, M. D.	Clerk and agent, board of health.
Malden.	*May C. Welsh	Board of health nurse.
Marlboro.	*Mary N. O'Connor, R. N.	
Medford.		Chairman, board of health.
Melrose.	Clarence P. Holden, M. D.	Board of health physician.
Methuen.	John Oddy, M. D.	
Millford.		Agent, board of health.
Milton.	Paul W. Kimball, M. D.	Do.
Natick.	Charles D. Colford, D. M. D.	Health officer and milk inspector.
Needham.	*G. Donald Buckner	Agent and medical officer.
New Bedford.	*A. N. Senesac, M. D.	Agent, board of health.
Newburyport.	*Wilbur N. O'Brien, Ph. G.	Director of public health.
Newton.	*Harold D. Choep, M. D., M. P. H.	Agent, board of health.
North Adams.	*Douglas W. Hyde, S. E.	
North Attleboro.		Do.
Northampton.	*George R. Turner	Do.
Norwood.	*John A. Shannon	Do.
Peabody.	*Percy F. Murray	Do.
Pittsfield.	*Willis M. Monroe, M. D., M. P. H.	Health commissioner.
Plymouth.	Almeda Chandler	Clerk, board of health.
Quincy.	Richard M. Ash, M. D.	Health commissioner.
Revere.	*Patrick C. Bruno	Health officer and milk inspector.
Salem.	*John J. McGrath	Agent, board of health.
Saugus.	James A. Clark, M. D.	Chairman, board of health.

City	Name of health officer	Official title
Massachusetts—Contd.		
Somerville	*Frank L. Morse, M. D.	Medical inspector and bacteriologist.
Southbridge	*Albert R. Brown	Agent, board of health.
Springfield	*Lawrence J. Smith, M. D.	Commissioner of public health.
Stoneham	*George A. Hinchcliff	Health officer.
Swampscott	*Clarence W. Horton	Do.
Taunton	John I. McNamara, M. D.	Chairman, board of health.
Wakefield	David Taggart	Health officer and agent.
Waltham	*Joseph T. Mulcahy	Director of public welfare.
Watertown	*Fred W. Bodge	Health officer.
Webster	Arthur D. Chartier, M. D.	Board of health physician.
Wellesley	Curtis M. Hilliard	Supervisor of health.
West Springfield	John J. Lysaght	Agent, board of health.
Westfield	Robert M. Marr, M. D.	Chairman, board of health.
Weymouth	Frederick L. Doucett, M. D.	Clerk, board of health.
Winchester	*Maurice Dinneen	Agent, board of health.
Winthrop	*William D. Childress	Health officer.
Woburn	*Edward F. Gorman	Agent and Secretary of board of health.
Worcester	*Peter O. Shea, M. D.	Director of health and school hygiene.
Michigan:		
Adrian	W. S. Mackenzie, M. D.	Health officer.
Alpena	Francis J. O'Donnell, M. D.	City health officer.
Ann Arbor	John A. Wessinger, M. D., Dr. P. H.	Do.
Battle Creek	*A. A. Hoyt, M. D.	Health officer.
Bay City	George W. Moore, M. D.	Do.
Benton Harbor	E. R. Taylor, M. D.	Director of public health.
Dearborn	Clarence A. Christensen, M. D.	Commissioner of health and sanitation.
Detroit	Board of health: Gustavus D. Pope William M. Walker William A. Evans, M. D. Ledru O. Gelb, M. D. F. Gardner Legg, B. C. E. Executive staff, department of health: *Henry F. Vaughan, Dr. F. H. Bert U. Estabrook, M. D. *Fred M. Meader, M. D. *Don W. Gudakunst, M. D., Dr. P. H. *Bruce H. Douglas, M. D. *G. M. Byington, M. D. *Joseph A. Kasper, M. D. *Carey P. McCord, M. D. *F. Gardner Legg, B. C. E. *Edward C. Schultz *John F. Roehl *George Sewell, M. D. *Grace Ross, R. N. *Franklin H. Top, M. D., C. P. H. Russell W. Alles, M. D. Otto Grob, M. D. A. C. Thompson, D. D. S. *G. Arthur Blakeslee *Sophia Halsted, M. S. *M. Eleanor McGarvah *Mary P. Connolly *Emma A. Boldt *George E. Phillips *Henry S. Willis, M. D.	President. Vice president. Secretary. Commissioner. Deputy commissioner. Deputy commissioner and director of medical services. Deputy commissioner and director of school health service. Tuberculosis controller. Director of medical relations. Director, public health laboratories. Director, bureau of industrial hygiene. Director, bureau of sanitary engineering. Director, bureau of dairy and food inspection. Director, division of special investigation. Acting director, division of social hygiene. Director, division of nursing. Director, division of epidemiology. Director, prenatal clinics. Acting director, division of child welfare. Director, school dental service. Director, division of vital statistics. Director, division of nutrition. Legal aid. Director, division of health education and editor "City Health." Assistant secretary. Superintendent, Herman Kiefer Hospital. Superintendent, William H. Maybury Sanatorium.
Eoorse		
Escanaba	C. A. Mooney, M. D.	Health officer.
Ferndale	*George Hays, M. D.	Health officer and registrar.
Flint	*John L. Lavan, M. D.	Health officer.
Grand Rapids	*Benjamin H. Warren, M. D.	Health commissioner.
Grosse Pointe	Stephen S. Skrzycki, M. D.	Do.
Hamtramck	William N. Braley, M. D.	Health officer.
Highland Park	W. M. Tappan, M. D.	Do.
Holland	J. L. Browning, M. D.	Do.
Iron Mountain	C. C. Urquhart, M. D.	City health officer.
Ironwood	*Elmer J. MacLachlan, D. V. M.	Health officer.
Jackson	*Irmel W. Brown, M. D.	Director of public health and welfare.
Kalamazoo	*E. R. Van der Slice, M. D.	Director of health.
Lansing	Dan R. Herkimer, M. D.	Health officer.
Lincoln Park	*Charles P. Drury, M. D.	Do.
Marquette	John T. Kaye, M. D.	Do.
Menominee		

City	Name of health officer	Official title
Michigan—Continued		
Monroe	James A. Humphrey, M. D.	Health officer.
Mount Clemens	W. J. Kane, M. D.	Do.
Muskegon	M. E. Stone, M. D.	Do.
Muskegon Heights	Otto M. LaCore, M. D.	Do.
Niles	Lawrence M. Rutz, M. D.	Health commissioner.
Owosso	W. E. Ward, M. D.	City health officer.
Pontiac	*Charles A. Neafie, M. D., M. S. in P. H.	Director of public health.
Port Huron	A. L. Callery, M. D.	Health officer.
River Rouge	Claude A. Smith, M. D.	Do.
Royal Oak	Donald A. Cameron, M. D.	City health officer.
Saginaw	*Frank A. Poole, M. D.	Do.
Sault Ste. Marie	*David Littlejohn, LL. D., M. D., Dr. P. H.	Director, county health department.
Traverse City	George A. Holliday, D. D. S., M. D.	Health officer.
Wyandotte	E. H. Engel, M. D.	Health commissioner.
Ypsilanti	Bradley M. Harris, M. D.	Health officer.
Minnesota:		
Albert Lea	Donald S. Branham, M. D.	Do.
Austin	H. M. Fisch, M. D.	City health officer.
Brainerd	R. A. Beise, M. D.	Chairman, board of health.
Duluth	*Mario McC. Fischer, M. D.	Director of public health.
Faribault	Frederick U. Davis, M. D.	Health commissioner.
Hibbing	Carl N. Harris, M. D.	Health director.
Mankato	Henry Bradley Troost, M. D.	City health officer.
Minneapolis	*Francis E. Harrington, LL. D., M. D.	Commissioner of health.
Rochester	T. B. Magath, M. D.	Health officer.
St. Cloud	Henry W. Goehrs, M. D.	City physician.
St. Paul	*Robert B. J. Schoch, M. D.	Chief health officer.
South St. Paul	O. S. Ely, M. D.	Commissioner of health.
Virginia	Robert P. Pearsall, M. D.	Health officer.
Winona	William V. Lindsay, M. D.	Do.
Mississippi:		
Biloxi	*E. E. Moore	Sanitary inspector.
Clarksdale	*N. C. Knight, M. D., C. P. H.	Director, county health department.
Columbus	C. E. Lehnberg, M. D.	County health officer.
Greenville	*John W. Schackelford, M. D., M. P. H.	Director, county health department.
Greenwood	*Levi A. Barnett, M. D.	Director of health.
Gulfport	*B. D. Blackwelder, M. D., C. P. H.	Director, county health department.
Hattiesburg	*William Earl Noblin, M. D.	Do.
Jackson	*A. R. Perry, M. D., M. P. H.	Do.
Laurel	*T. Paul Haney, Jr., M. D., C. P. H.	County health officer.
McComb	*D. V. Galloway, M. D., M. P. H.	Do.
Meridian	*C. R. Gillespie, M. D.	Director, county health department.
Natchez	*F. Michael Smith, M. D.	Do.
Vicksburg		
Missouri:		
Cape Girardeau	*C. C. Summers	Health officer.
Columbia	A. W. Kampschmidt, M. D.	Health commissioner.
Hannibal	*E. M. Lueke, M. D.	Health officer.
Independence	*Joseph T. Brennan, M. D.	County health commissioner.
Jefferson City	James G. Bruce, M. D.	City physician.
Joplin	V. E. Kenney, M. D.	Commissioner of health and sanitation.
Kansas City	Edwin H. Schorer, M. D., Dr. P. H.	Health director.
Maplewood	E. E. Tremain, M. D.	Commissioner of health.
Moberly	Ottis O. Ash, M. D.	City health commissioner.
St. Charles	L. E. Belding, M. D.	City health officer.
St. Joseph	J. M. Allaman, Ph. G., M. D.	Health officer.
St. Louis	*Jos. F. Bredeck, M. D., D. P. H.	Health commissioner.
	*H. I. Spector, M. D.	Assistant health commissioner.
	*Jos. C. Willett, D. V. M.	Chief of laboratories.
	Arthur Kelley	Chief of food control.
	Milton R. Fisher, D. V. M.	Milk controller.
	*Walter E. Cook	Acting chief sanitary section.
	*Harry M. Stamm, D. D. S.	Dental supervisor.
	*Clyde Kane, M. D.	Acting chief, venereal clinic.
	*Mildred Sanderson, R. N.	Municipal nurses' supervisor.
	*W. C. Dillard, D. V. M.	Veterinary meat inspector.
	*H. V. Persells, D. V. M.	Do.
	*C. B. Michael, D. V. M.	Do.
	*Downey L. Harris, M. D.	Rabies controller.
	*Elmer Rosenthal	Recorder of births and deaths.
	J. Earl Smith, M. D.	Epidemiologist.
	*O. W. Noyes, D. V. M.	Supervisor, meat control.
	*Arthur H. Knost, D. V. M.	Veterinary milk inspector.
	*L. A. Rosner, D. V. M.	Do.
	*C. A. Paige, D. V. M.	Do.
Sedalia	E. C. Snively, M. D.	Health officer.

* D. C. Lockhead, M. D., D. P. H., deputy health officer, full time.

City	Name of health officer	Official title
Missouri—Continued		
Springfield.....	*Charles A. George, M. D.....	Commissioner of health and sanitation.
University City.....	O. P. Hampton, Jr., M. D.....	Health commissioner.
Webster Grove.....	Carl C. Irick, M. D.....	Do.
Montana:		
Anaconda.....	J. L. O'Rourke, M. D.....	City health officer.
Billings.....	A. E. Stripp, M. D.....	Do.
Butte.....	Frank J. Williams, M. D.....	Do.
Great Falls.....	*Frank L. Watkins, M. D.....	City and county health officer.
Helena.....	*R. G. M. Ehlers, M. D., C. P. H.....	Do.
Missoula.....	*F. D. Pease, M. D.....	Health officer.
Nebraska:		
Beatrice.....	J. R. Leible, M. D.....	City physician.
Fremont.....	Richard T. Van Metre, M. D.....	City health officer.
Grand Island.....	John G. Woodin, M. D.....	City physician.
Hastings.....	J. W. Brown, M. D.....	Do.
Lincoln.....	*Milton F. Arnholt, M. D.....	Superintendent of health.
Norfolk.....	Victor L. Siman, M. D.....	City health officer.
North Platte.....	E. W. Fetter, M. D.....	City physician.
Omaha.....	Floyd H. Kinyoun, M. D.....	Health commissioner.
Nevada:		
Reno.....	John J. Sullivan, M. D.....	Secretary, city board of health.
New Hampshire:		
Berlin.....	*John C. Greenan.....	Health officer.
Claremont.....	William P. Prescott.....	Do.
Concord.....	*Donald G. Barton, M. D.....	Sanitary officer.
Dover.....	*George E. Brennan.....	Health officer.
Keene.....	*Evan Carpenter White.....	Do.
Laconia.....	E. J. Gage, M. D.....	Secretary, board of health.
Manchester.....	*Howard A. Streeter, M. D.....	Health officer.
Nashua.....	Oswald S. Maynard, M. D.....	Chairman, board of health.
Portsmouth.....	George A. Fredrick, M. D.....	Health officer.
Rochester.....	Charles E. Goodwin.....	Do.
New Jersey:		
Asbury Park.....	*Budd H. Obert.....	Health officer and registrar of vital statistics.
Atlantic City.....	Samuel L. Salasin, M. D.....	Health officer.
Bayonne.....	William W. Brooke, M. D.....	Do.
Belleville.....	*Eugene T. Berry.....	Do.
Bloomfield.....	*Joseph C. Saille, Ph. G., D. V. S., D. O.....	Do.
Bridgeton.....	*John G. Robbins.....	Health and plumbing inspector.
Burlington.....	*Harold T. Blinn.....	Executive officer.
Camden.....	*Arthur L. Stone, M. D.....	Director of public health.
Carteret.....		
Cliffside Park.....	Frederick J. Dyer.....	Health officer.
Clifton.....	Lester F. Meloney, M. D.....	Do.
Collingswood.....	Harold K. Eynon, M. D.....	Do.
Dover.....	*John G. Taylor.....	Do.
East Orange.....	*Frank J. Osborne, B. S. in P. H.....	Health officer and registrar.
Elizabeth.....	*Louis J. Richards, S. B. in S. E.....	Health officer.
Englewood.....	*Hugh B. Martin, M. S. C. E.....	Do.
Garfield.....	Charles B. Bleasby, M. D.....	Do.
Gloucester City.....	J. Alonzo Beek, M. D.....	Do.
Hackensack.....	*L. Van D. Chandler.....	Do.
Harrison.....	*John T. McClure.....	Do.
Hawthorne.....	T. J. Emberton Holmes, M. D.....	Sanitary inspector.
Hoboken.....	Joseph F. X. Stack, M. D.....	Commissioner of health.
Irvington.....	*William S. Bailey.....	Health officer.
Jersey City.....	*James J. Hagan.....	Do.
Kearny.....	*Amos Field, Jr.....	Do.
Linden.....	*Maidie E. Noe.....	Do.
Lodi.....	Henry H. Brevoort, M. D.....	Do.
Long Branch.....	*R. C. Erickson.....	Do.
Millville.....	Richard H. Knowles, Ph. G.....	Do.
Montclair.....	*Carl T. Pomeroy, C. P. H.....	Do.
Morristown.....	*John F. Kilkenny.....	Do.
New Brunswick.....	Edwin I. Cronk, M. D.....	City health officer.
Newark.....	*Charles V. Craster, M. D., D. P. H.....	Health officer.
Nutley.....	*Richard V. Fellers.....	Do.
Orange.....	W. M. Brien, M. D.....	Health officer and registrar of vital statistics.
Passaic.....	John N. Ryan, M. D.....	Health officer.
Paterson.....	*Frederick P. Lee, M. D.....	Do.
Perth Amboy.....	*Charles S. Thompson, D. V. S.....	Health officer.
Phillipsburg.....	William Dana Pursel, D. D. S., M. D.....	Town physician.
Plainfield.....	*Andrew J. Krog.....	Health officer.
Pleasantville.....	Robert M. Grier, M. D.....	Health inspector.
Rahway.....	*Fred M. Williams.....	Health officer and registrar of vital statistics.
Red Bank.....	Wm. H. Lawes, D. V. S.....	Sanitary inspectors.
Ridgefield Park.....	William F. Reynolds, D. V. M.....	Health officer.
Ridgewood.....	Joseph F. Benjamin, M. D.....	Do.

City	Name of health officer	Official title
New Jersey—Contd.		
Roselle	Perry A. Proudfoot, M. D.	Health officer.
Rutherford	*Marine Dunn	Do.
South Orange	A. C. Benedict, M. D.	Do.
South River	A. A. Pansey, M. D.	Health inspector.
Summit	Henry P. Dengler, M. D.	Executive officer.
Trenton	*Alton S. Fell, M. D.	Health officer and director of public welfare.
Union City	Grant P. Curtis, M. D.	Health officer.
West New York	Harry G. Eakin, Ph. G., M. D.	Health inspector.
West Orange	Kurt W. Thum, M. D.	Director of health.
Westfield	*Andrew Carney	Executive officer.
New Mexico:		
Albuquerque	*Julian O. Long, M. D., C. P. H.	District health officer.
Roswell	*O. E. Puckett, M. D.	Do.
Santa Fe	*F. W. Parker, Jr., M. D., C. P. H.	Do.
New York:		
Albany	*Daniel V. O'Leary, M. D.	Commissioner of health.
Amsterdam	P. J. Fitzgibbons, M. D.	Health commissioner and registrar of vital statistics.
Auburn	John W. Copeland, M. D.	Health officer.
Batavia	Emery F. Will, M. D.	Do.
Beacon	Charles B. Dugan, Ph. B., M. D.	Do.
Binghamton	Chalmer J. Longstreet, M. D.	Do.
Buffalo	*Francis E. Fronczak, LL. D., M. D., Dr. Sc., P. H.	Health commissioner.
	*Edward Durney, M. D.	Deputy health officer.
	*Charles A. Bentz, M. D.	Do.
	*Edward Durney, M. D.	Director.
Division of child hygiene.	*Charles A. Bentz, M. D.	Do.
Communicable disease and division of laboratories.		
Division of vital statistics.	*Wm. J. Winn	Registrar of vital statistics.
Division of sanitation.	*Frank E. Trumble	Assistant chief inspector.
Division of smoke abatement.	do	Do.
Division of food inspection.	*Willard B. Diebold	Do.
J. N. Adam Memorial Hospital (Perrysburg N. Y.).	Horace Lo Grasso, M. D.	Superintendent.
Cohoes	E. M. Bell, M. D., P. H. D.	Commissioner of health.
Corning	Henry E. Elwood, Jr., M. D.	Health officer.
Cortland	*Merle R. French, M. D.	Commissioner of health.
Dunkirk	Edgar Bieber, M. D.	Health officer.
Elmira	Reeve B. Howland, M. D.	Do.
Endicott	John M. Mallory, M. D.	Do.
Floral Park	Arthur E. Goldfarb, M. D.	Do.
Freeport	William H. Runcie, M. D.	Do.
Fulton	Harold F. McGovern, M. D.	Health officer and city physician.
Geneva	C. W. Grove, M. D.	Health officer.
Glen Cove	Joseph B. Conolly, M. D.	Do.
Glens Falls	*Virgil D. Selleck, M. D., C. P. H.	Do.
Gloversville	A. L. Johnson, M. D.	Do.
Hempstead	William H. Runcie, M. D.	Do.
Herkimer	James W. Graves, M. D.	Do.
Hornell	George E. Taylor, M. D.	Do.
Hudson	*Louis Van Hoesen, M. D.	Commissioner of health.
Ithaca	*Lewell T. Genung, M. D.	Health officer.
Jamestown	William M. Sill, M. D.	Superintendent of public health.
Johnson City	Walter J. Farrell, Phar. D., M. D.	Health officer.
Johnstown	Guy Vall Wilson, M. D.	Commissioner of public health and welfare.
Kenmore	E. R. Linklater, M. D.	Health officer.
Kingston	Lester E. Sanford, M. D.	Do.
Lackawanna	A. S. Culkowski, M. D.	Do.
Little Falls	A. B. Santry, M. D.	Do.
Lockport	Lyman H. Wheeler, M. D.	Health officer and city physician.
Lynbrook	F. Maxwell Galloway, M. D.	Health officer.
Mamaroneck	Edward M. Clark, M. D.	Do.
Massena	C. E. Elkins, M. D.	Do.
Middletown	*Hilton J. Shelley, M. D.	Do.
Mount Vernon	*F. W. Shipman, M. D.	Commissioner of public health.
New Rochelle	*Bertrand F. Drake, M. D., Dr. P. H.	Health officer.
New York	*John L. Rice, M. D.	Commissioner of health.
	*William H. Best, M. D.	Deputy commissioner of health.
	*George T. Palmer, Dr. P. H.	Do.
	*Sol Pincus, C. E.	Do.
Bureau:		
General Administration.	*Maurice G. Postley	Secretary.
Records.	*Thomas J. Duffield	Registrar of records.

City	Name of health officer	Official title
New York—Continued		
New York—Continued		
Bureau—Continued		
Sanitation.....	*John Oberwager, M. D.....	Director.
Preventable Dis-	*Samuel Frant, M. D.....	Epidemiologist.
eases.....		
Child Hygiene.....	*Jules Blumenthal, M. D., Dr. P. H.....	Director.
School Hygiene.....	*Elwood S. Morton, M. D.....	Do.
Nursing.....	*Miss Amelia H. Grant, R. N.....	Do.
Public health ed-	*Charles F. Bolduan, M. D.....	Do.
ucation.....		
Laboratories.....	*Ralph S. Muckenfuss, M. D.....	Do.
Food and Drugs.....	*Abraham Lichterman.....	Acting director.
District health ad-	*Margaret W. Barnard, M. D., Dr.	Director.
ministration.....	P. H.....	
Tuberculosis.....	*Herbert R. Edwards, M. D.....	Do.
Social hygiene.....	*Theodore L. Rosenthal, M. D.....	Do.
Newburgh.....	Thomas J. Burke, M. D.....	Health officer.
Niagara Falls.....	Edward E. Gillick, M. D.....	Do.
North Tonawanda.....	Henry C. Lapp, M. D.....	Do.
Ogdensburg.....	Frederick E. Clark, M. D.....	Do.
Olean.....	John A. Johnson, M. D.....	Health commissioner.
Oneida.....	Edmund L. Finley, M. D.....	Health officer.
Oneonta.....	E. P. Hall, M. D.....	Do.
Ossining.....	Robert R. Bloom, M. D.....	Do.
Oswego.....	James E. Mansfield, M. D.....	Do.
Peekskill.....	J. Douglas Barry, M. D.....	Do.
Plattsburg.....	Leo F. Schiff, M. D.....	Do.
Port Chester.....	William J. Sheehan, M. D.....	Do.
Port Jervis.....	G. Otto Pobe, M. D.....	Do.
Poughkeepsie.....		
Rensselaer.....		
Rochester.....	*Arthur M. Johnson, M. D.....	Health officer.
Rockville Centre.....	*Bruce B. Preas, M. D.....	Do.
Rome.....	Lewis N. Eames, M. D.....	Do.
Saratoga Springs.....	Frederic J. Resseguie, M. D.....	Do.
Schenectady.....	*William C. Treder, M. D.....	Commissioner of health.
Syracuse.....	*Gregory D. Mahar, M. D.....	Do.
Tonawanda.....	Russell H. Wilcox, M. D.....	Health officer.
Troy.....	James H. Flynn, M. D.....	Commissioner of health.
Utica.....	*Hugh H. Shaw, M. D.....	Health officer.
Valley Stream.....	John M. Quinn, M. D.....	Do.
Watertown.....	George B. Van Doren, M. D.....	Do.
Watervliet.....	Charles A. Birmingham, M. D.....	Do.
White Plains.....	*Matthias Nicoll, Jr., M. D.....	County commissioner of health.
Yonkers.....	*Eugene F. McGilligan, M. D., M. S.	Commissioner of health.
	in P. H.....	
North Carolina:		
Asheville.....	*John W. Williams, M. D., C. P. H.....	Health officer.
Charlotte.....	*G. L. Rea, M. D.....	Commissioner of health.
Concord.....	*Daniel G. Caldwell, M. D.....	County health officer.
Durham.....	*Jesse H. Epperson.....	Superintendent of health.
Elizabeth City.....	Thomas S. McMullan, M. D.....	Municipal health officer.
Fayetteville.....	*Malcolm T. Foster, M. D., C. P. H.....	County health officer.
Gastonia.....	L. N. Patrick, Ph.D., M. D.....	City health officer.
Goldboro.....	*Samuel B. McPheeters, M. D.,	Director of public health.
	C. P. H.....	
Greensboro.....	*C. Curtis Anderson, M. D.....	Health officer.
High Point.....	*R. A. Herring, M. D.....	Director of health.
Kinston.....	*Z. V. Moseley, M. D.....	County health officer.
New Bern.....	*John S. Anderson, M. D.....	Do.
Raleigh.....	*A. C. Bulla, M. D.....	Do.
Rocky Mount.....	*J. Allen Whitaker, M. D.....	Superintendent, city health depart-
		ment.
Salisbury.....	*Charles W. Armstrong, M. D.....	Health officer.
Shelby.....	H. C. Thompson, M. D.....	County physician and quarantine
		officer.
Statesville.....		
Thomasville.....		
Wilmington.....	*A. H. Elliot, M. D.....	County health officer.
Wilson.....	*W. H. Anderson, M. D.....	Health officer.
Winston-Salem.....	*R. L. Carlton, M. D.....	City health officer.
North Dakota:		
Bismarck.....	Albert M. Fisher, M. D.....	Do.
Fargo.....	*H. J. Skarshaug, M. D.....	City health officer.
Grand Forks.....	E. C. Haagensen, M. D.....	Health officer.
Minot.....	J. L. Devine, M. D.....	City health officer.
Ohio:		
Akron.....	*Melville D. Alles, LL.B., M. D.....	Director of health.
Alliance.....	G. O. Rowland, M. D.....	Health commissioner.
Ashland.....	Robert P. Bogniard, M. D.....	Director of welfare.
Ashtabula.....	James H. Park, M. D.....	Health officer.
Barberton.....	H. A. Finefrock, M. D.....	Health commissioner.
Bellaire.....	William J. Shepard, M. D.....	Do.
Bucyrus.....	*W. G. Carlisle, M. D.....	Do.
Cambridge.....	Carl M. Oshe.....	City health commissioner.
Cambell.....	James S. Mariner, M. D.....	Health commissioner.

City	Name of health officer	Official title
Ohio—Continued		
Canton	Frank M. Sayre, M. D.	Health commissioner.
Chillicothe	*Raymond E. Bower, Ph. B., M. D.	Do.
Cincinnati	*F. K. Harder, M. D.	Acting health commissioner.
Cleveland	*Harold J. Knapp, M. D.	Commissioner.
Division:		
Communicable diseases	*T. G. Duncan, M. D.	Chief.
Veneral diseases	E. J. Braun, M. D.	Do.
Tuberculosis	E. P. Edwards, M. D.	Do.
Child hygiene	*R. J. Ochsner, M. D.	Do.
School health service	*J. G. Smith, M. D.	Do.
Food and Drug administration	*E. B. Buchanan	Do.
Laboratories	Emerson Megrill, M. D.	Consulting laboratory director.
	*Wm. H. Hay, LL. B.	Chief of laboratories.
	*Cora M. Templeton, R. N.	Director.
Public health nurses		
Vital statistics	*Sara B. Hartley	Chief.
Cleveland Heights	*Robert Lockhart, M. D.	County health officer.
Columbus	*Nelson C. Dysart, Ph. C., M. D.	Health commissioner.
Coshocton	J. D. Lower, M. D.	Do.
Cuyahoga Falls	*R. H. Markwith, M. D.	Commissioner of health.
Dayton	A. O. Peters, M. D.	Do.
East Cleveland	George W. Stober, M. D.	Director of health.
East Liverpool	Roy C. Costello, M. D.	Health commissioner.
Elyria	George E. French, M. D.	Do.
Euclid	William Baeckler	Safety director.
Findlay	*Martha Luffey, R. N.	Health commissioner.
Fostoria	*H. A. DeVore	Do.
Fremont	E. L. Vermilya, M. D.	Do.
Garfield Heights	*J. A. Doull, M. D., D. P. H.	Acting county health commissioner.
Hamilton	*C. J. Baldridge, B. L., M. D.	Health commissioner.
Ironton	*Harry Sherwood Allen, M. D.	Do.
Lakewood	Wallace J. Benner, M. D.	Do.
Lancaster	Clifford B. Snider, B. S. in Agr., M. D.	Do.
Lima	James B. Poling, M. D.	Do.
Lorain	Valloyd Adair, M. D.	Do.
Mansfield	*Roy C. Rehder, M. D.	Do.
Marletta	F. S. McGee, M. D.	Do.
Marion	M. M. Weinbaum, M. D.	Do.
Martins Ferry	*John Donovan	Do.
Massillon	*Dwight L. Fisher	Do.
Middletown	*George D. Lummis, M. D.	Do.
New Philadelphia	*Joseph Blickensderfer, M. D.	Do.
Newark	W. H. Knauss, M. D.	Do.
Niles	W. A. Werner, M. D.	Do.
Norwood	*R. E. Hatfield, M. D.	Commissioner of health.
Painesville	*Clara Carter Wilder, R. N.	Health commissioner.
Parma	Robert Lockhart, M. D.	County health officer.
Piqua	F. Robert Buechner	Health commissioner.
Portsmouth	Oral D. Tatje, M. D.	Do.
Salem	Raymond T. Holzbach, M. D.	Do.
Sandusky	*F. M. Houghtaling, M. D.	Do.
Shaker Heights	Paul M. Spurney, M. D.	Director of health.
Springfield	*Oscar M. Craven, M. D.	Director of public health.
Steuenville	*Julius A. Pizzoferrato	Health commissioner.
Struthers	*Henry M. Crowe	Sanitary officer.
Tiffin	J. A. Gosling, M. D.	Health commissioner.
Toledo	*Millard C. Hanson, M. D., Dr. P. H.	Director of health.
Warren	M. T. Knappenberger, M. D.	Health commissioner.
Wooster	*John J. Sutter, M. D.	Do.
Xenia	A. D. DeHaven, M. D.	Do.
Youngstown	Wallace W. Ryall, M. D.	Commissioner of health.
Zanesville	D. G. Candy, M. D.	Superintendent of health and sanitation.
Oklahoma:		
Ada	*Glen W. McDonald, M. D.	Director, county health unit.
Ardmore	A. Y. Easterwood, M. D.	City physician.
Bartlesville	Elizabeth Chamberlin, M. D.	City superintendent of health.
Chickasha	S. O. Marrs, M. D.	City health commissioner.
Enid	R. C. Baker, M. D.	City superintendent of health.
Lawton	*Kenneth P. Cash	City chemist.
McAlester		
Muskogee	James T. Nichols	City superintendent of health.
Oklahoma City	Walter H. Miles, M. D.	Director of health.
Okmulgee		
Ponca City	*Charles C. Gardner, M. D.	City health director.
Sapulpa		
Seminole	*George Hunter, M. D.	County superintendent of health.
Shawnee	T. D. Rowland, M. D.	City physician.
Tulsa	J. Jeff Billington, M. D.	Superintendent of health.
Wewoka	*George Hunter, M. D.	County superintendent of health.

City	Name of health officer	Official title
Oregon:		
Astoria	Nellie S. Vernon, M. D.	City health officer.
Eugene	*Elsworth L. Gardner, M. D.	City and county health officer.
Klamath Falls	*Neil Black, M. D.	County health officer.
Medford	L. D. Inskip, M. D.	City health officer.
Portland	*Adolph Weinzirl, M. D., C. P. H.	Health officer.
Salem	*Vernon A. Douglas, M. D., C. P. H.	City and county health officer.
Pennsylvania:		
Alliquippa	*J. E. Tanner	Health officer.
Allentown	*J. Treichler Butz, D. D. S., M. D.	Do.
Altoona	*Raymond A. Herbert	Superintendent of health.
Ambridge	*Louis Herrmann	Health officer.
Arnold	William G. Ihrig	Do.
Beaver Falls	*H. B. Plummer	Do.
Bellevue	*Mrs. G. P. Brown	Do.
Berwick		
Bethlehem	Francis J. Conahan, M. D.	City physician.
Bradock	*Samuel J. Escher	Health officer.
Bradford	*R. G. Vogel	Do.
Bristol	John M. Wright	Do.
Butler	*Edgar L. Geibel	Do.
Canonsburg	*Frank Milligan	Do.
Carbondale	*Arthur J. Dearie	Do.
Carlisle		
Carnegie	*George W. Schaffer	Do.
Chambersburg	*Frank J. Croft	City health officer.
Charleroi	*J. M. Hill	Health officer and inspector.
Chester		
Clairton	*W. F. Connelly	Health officer.
Coatesville	Charles V. Peace, V. M. D.	Do.
Columbia	G. M. Rodenhauser	Do.
Connellsville	*Charles H. Balsley	Do.
Conshohocken	Thomas S. White	Health officer and secretary.
Coraopolis	*D. K. Clever, M. D.	Health officer.
Dickson City	Joseph Malinoski	Secretary, board of health.
Donora	*Herman Lang	Health officer.
Dormont		
Du Bois	J. I. Brockbank, M. D.	Do.
Dunmore	William Ferrese	Do.
Duquesne	*Francis P. Long	Sanitary police officer.
Easton	R. S. Raub, M. D.	Health officer.
Ellwood City	*Lewis Young	Do.
Erie	*James R. Smith, M. D.	Do.
Farrell	*Ben F. Davis	Do.
Franklin		
Greensburg	*Joseph B. Cherry	Health officer and secretary.
Hannover	Nevin H. Seltz, M. D.	Secretary, board of health.
Harrisburg	John M. J. Raunick, M. D.	Health officer.
Hazleton	*William Pfaff	Do.
Homestead		
Jeannette	*Charles E. Walter	Chief health officer.
Johnstown	L. L. Porch, M. D.	City physician.
Kingston	*J. F. Seward	Health officer.
Lancaster	*Benjamin F. Charles	Do.
Latrobe	W. T. Osborne	Do.
Lebanon	C. Ray Bell, M. D.	City health officer.
Lewistown	H. E. Fetterolf	Health officer.
McKeesport	*Daniel F. Marsh	Do.
McKees Rocks	*John Driscoll	Do.
Mahanoy City	*William Walker	Do.
Meadville	*John Laley	Do.
Monessen	*Francis C. Duvall, M. D.	Do.
Mount Carmel	*Howard Zieger	Do.
Munhall	*Henry Gillard	Do.
Nanticoke	*H. Judd Abbott	Do.
New Castle	William L. Steen, M. D.	Health officer.
New Kensington	*John H. Erasus	Do.
Norristown	*J. Cleve Cassel	Do.
North Braddock	*Michael J. Pastor	Do.
Oil City	*William J. Lewis	Do.
Old Forge		
Olyphant	Andrew Toras	Do.
Philadelphia:		
Department of public health.	*Wm. C. Hunsicker, M. D.	Director, department of public health.
	*Alfred F. Allman, M. D.	Assistant Director, department of public health.
Bureau of health.	*William J. Wolf	Secretary.
Bureau of hospitals:		
Philadelphia General Hospital, 34th and Pine Streets.	*William G. Turnbull, M. D.	Superintendent.

City	Name of health officer	Official title
Pennsylvania—Contd.		
Philadelphia—Contd.		
Bureau of hospitals—Continued		
Philadelphia Hospital for Contagious Diseases, 2d and Luzerne Sts.	*Pascal F. Lucchesi, M. D.	Superintendent.
Philadelphia Hospital for Mental Diseases, Byberry.	*Wilbur P. Rickert, M. D.	Do.
Phoenixville	*Russell E. Deery	Health officer.
Pittsburgh	*I. Hope Alexander, M. D.	Director.
Bureau of infectious diseases (including municipal and tuberculosis hospitals).	*P. E. Marks, M. D.	Superintendent.
Bureau of sanitation.	*George W. Schusler, C. E.	Do.
Bureau of child welfare.	*H. J. Benz, M. D.	Do.
Bureau of food inspection.	*Howard Patton	Do.
Bureau of smoke regulation.	H. B. Meller, C. E.	Do.
Pittston	*Michael A. McHale	Health officer.
Plymouth	H. G. Templeton, M. D.	Do.
Pottstown	*A. John André	Do.
Pottsville	*A. C. Huntzinger	Do.
Reading	*Ira J. Hain, M. D.	Do.
Scranton	Arthur E. Davis, M. D.	Director, department of health.
Shamokin	*Frederick Zeiser	Officer, board of health.
Sharon	*Joseph S. Hildebrand	Sanitary officer.
Shenandoah	*Charles Bell	Health officer.
Steelton	*E. G. Butler	Do.
Sunbury	*Carl P. Inkrote	Do.
Swissvale	*Samuel L. Glasgow	Do.
Tamaqua	Lamont Perrine	Do.
Taylor	E. E. Edwards, M. D.	Do.
Turtle Creek	*Manuel Emmanuel	Do.
Uniontown	*J. R. West	Do.
Vandergrift	J. D. Remaley	Do.
Warren	*Ralph N. Brown	Do.
Washington	*C. E. Houston	Do.
Waynesboro	Mrs. Verne L. Snowberger	Do.
West Chester	Warren T. Garrett	Do.
Wilkes-Barre	*Jacques P. Gray, M. D., M. P. H.	Do.
Wilkinsburg	*J. M. Snyder	Do.
Williamsport	*William J. Mollenkopf	Do.
York	John D. Yeagley, M. D.	Director of public health.
Rhode Island:		
Bristol	Matthew G. Maetozo	City health officer.
Central Falls	Omer H. Masse, M. D.	City physician.
Cranston	Daniel S. Latham, M. D.	Superintendent of health.
Cumberland	Stephen A. Kenny, M. D., Valley Falls.	Health officer.
East Providence	William H. T. Hamill, M. D.	Do.
Newport	Edward V. Murphy, M. D.	Commissioner of health.
North Providence	Joseph A. St. Angelo, Ph. G., M. D.	Chief health officer.
Pawtucket	Albert L. Vandale, M. D.	Superintendent of health.
Providence	*Michael J. Nestor, M. D.	Do.
Warwick	*William H. Dyer, M. D.	Do.
Westerly	Samuel C. Webster, Ph. G., M. D.	Do.
Woonsocket	James P. O'Brien, M. D., C. P. H.	Health officer.
South Carolina:		
Anderson	*Goodman Bare, M. D.	County health director.
Charleston	*Leon Banov, M. D.	Do.
Columbia	P. E. Payne, M. D.	City health officer.
Florence	*George D. Heath, M. D., Dr. P. H.	Health commissioner.
Greenville	*Irving Sydnor Barksdale, M. D.	Commissioner of health.
Greenwood	*Joseph E. Brodie, M. D.	County health officer.
Rock Hill	Roy D. Sumner, M. D.	City physician.
Spartanburg	*W. O. Wrightson, M. D.	Health officer.
Sumter	*George R. Kitchen, D. V. M.	City health officer.
South Dakota:		
Aberdeen	J. F. Adams, M. D.	Do.
Huron	T. J. Wood, M. D.	Health officer.
Mitchell	E. M. Young, M. D.	City health officer.
Rapid City	*H. D. Lien, M. D.	Director, county health unit.
Sioux Falls	Emil G. Ericksen, M. D.	Health officer.
Watertown		

City	Name of health officer	Official title
Tennessee:		
Bristol	*F. L. Moore, M. D., C. P. H.	County health officer.
Chattanooga	John W. L. Cooper, M. D.	Director of health.
Jackson	Herman Hawkins, M. D.	City health officer.
Johnson City	*E. E. Carrier, M. D.	Director, city health department.
Kingsport	*F. L. Moore, M. D., C. P. H.	County health officer.
Knoxville	*William H. Ennels, M. D., M. P. H.	City health officer.
Memphis	*Lloyd M. Graves, M. D.	Superintendent of health.
Nashville	*John Overton, M. D.	City health officer.
Texas:		
Abilene		
Amarillo	*B. M. Primer, M. D., M. P. H.	Director of health unit.
Austin	*Banner Gregg, M. D.	City health officer.
Beaumont	W. W. Dunn, M. D.	Do.
Big Spring	M. H. Bennett, M. D.	Do.
Brownsville	Thurman Archer Kinder, Jr., M. D.	Do.
Brownwood	J. M. Horn, M. D.	Do.
Cleburne	Joseph M. Stallcup, M. D.	Do.
Corpus Christi		
Corsicana	William T. Shell, Jr., M. D.	Do.
Dallas	*James W. Bass, M. D.	Director of public health.
Del Rio	D. A. York, M. D.	City health officer.
Denison	William A. Lee, M. D.	Do.
El Paso	*John W. Tappan, M. D.	Director, county health unit.
Fort Worth	*Arthur Heath Flickwir, M. D.	Director of public health and welfare.
Galveston	Walter Kleberg, M. D.	City health officer.
Greenville	John S. Cooper, M. D.	Do.
Harlingen	V. M. Bass, M. D.	Do.
Houston	*John W. Brown, M. D., C. P. H.	Director of public health.
Laredo	Albert Thos. Cook, M. D.	City health officer.
Lubbock	J. W. Rollo, M. D.	Do.
Marshall	W. H. Bennett, M. D.	City health officer and food inspector.
Palestine	John M. Colley, M. D.	City health officer.
Pampa	K. L. Buckner, M. D.	Do.
Paris	John A. Stephens, M. D.	Do.
Port Arthur	Frank J. Beyt, M. D.	Do.
San Angelo	Brian T. Brown, M. D.	Do.
San Antonio	*W. A. King, M. D.	Do.
San Benito		
Sherman	B. A. Russell, M. D.	County health officer.
Sweetwater	*George A. Gray, M. D.	City health officer.
Temple	*E. W. Prothro, M. D.	Director, county health unit.
Texarkana	Charles A. Smith, M. D.	City health officer.
Tyler	Albert Woldert, Ph. G., M. D.	Do.
Waco	*George M. Liddell, M. D.	Do.
Wichita Falls	*John H. Fletcher, M. D.	Do.
Utah:		
Ogden	W. J. Wilson, M. D.	City physician.
Provo	*Charles M. Smith, M. D.	Do.
Salt Lake City	T. J. Howells, M. D.	Health commissioner.
Vermont:		
Barre	J. J. Tomasi, M. D.	City health officer.
Bennington	Joseph M. Ayres	Do.
Burlington	Erald F. Foster, M. D.	Do.
Rutland	*Clare M. Cole	Health officer.
Virginia:		
Alexandria	W. Lewis Schafer, M. D.	Health officer and clinician.
Charlottesville	*Robert D. Hollowell, M. D.	City-county health officer.
Danville	*R. W. Garnett, M. D.	Health officer and director of public welfare.
Hopewell	L. A. Sims	Acting city engineer.
Lynchburg	*Mosby G. Perrow	Director of public welfare.
Newport News	*G. Colbert Tyler, M. D.	Health officer.
Norfolk	*John C. Sleet, M. D.	Health commissioner.
Petersburg	Mason Romaine, M. D.	Health officer.
Portsmouth	*L. H. Denny, M. D.	Director of public welfare.
Richmond	W. Brownley Foster, M. D.	Do.
Roanoke	*Coleman B. Ransone, M. D.	Health officer.
Staunton	C. W. Rodgers, M. D.	Do.
Suffolk	*Charles C. Hedges, M. D.	Do.
Winchester	L. M. Allen, M. D.	Do.
Washington:		
Aberdeen	B. O. Swinehart, M. D.	City health officer.
Bellingham		
Bremerton	David H. Polk, M. D.	Do.
Everett	J. Walter Darrough, M. D.	Do.
Hoquiam	Harry C. Watkins, M. D.	Do.
Longview	J. S. McCarthy, M. D.	Do.
Olympia	*Sanford Lehman, M. D.	City-county health officer.
Port Angeles	*Leland E. Powers, M. D.	Do.
Seattle	*Frank M. Carroll, M. D.	Commissioner of health.
Spokane	*Ralph Hendricks, M. D.	Commissioner of public affairs and health officer.
Tacoma	S. M. Creswell, M. D.	Director of health.
Vancouver	*J. A. Kahl, M. D.	City and county health officer.
Walla Walla	*Alfred Ernest Eyres, M. D.	City and county director of health.

City	Name of health officer	Official title
Washington—Contd.		
Wenatchee	*C. R. Fargher, M. D.	City-county health officer.
Yakima	*Lloyd Moffitt, M. D.	Do.
West Virginia:		
Bluefield	*David B. Lepper, M. D., C. P. H.	City health director.
Charleston	*Herbert B. Wise, M. D.	Health commissioner.
Clarksburg		
Fairmont	L. N. Yost, Ph. G., M. D.	County health officer.
Huntington	*Andy Houvouras	Sanitary inspector.
Martinsburg	*Claude A. Thomas, M. D.	County health officer.
Morgantown	*Rex A. Burdette, Ph. G., M. D.	City and county health director.
Moundsville	*William G. C. Hill, Ph. G., M. D.	Health director.
Parkersburg	*Arthur D. Knott, M. D., D. P. H.	City and county health officer.
Wheeling	*Reece M. Pedicord, M. D.	Do.
Wisconsin:		
Appleton	John C. Troxel, M. D.	Health commissioner.
Ashland	C. O. Hertzmann, M. D.	Do.
Beloit	Richard A. Thayer, M. D.	Health officer.
Cudahy	C. D. Partridge, M. D.	Health commissioner.
Eau Claire	L. H. Flynn, M. D.	Health officer.
Fond du Lac	*Edward H. Pawsat, M. D.	Do.
Green Bay	Henry S. Atkinson, M. D.	City physician and health commissioner.
Janesville	*Fred B. Welch, M. D.	City health officer.
Kenosha	*G. Windesheim, M. D.	Director of health.
La Crosse	*Anthony M. Murphy	Health officer.
Madison	*F. F. Bowman, B. L., M. D.	Do.
Manitowoc	George M. Hoffman, Ph. G., M. D.	Health commissioner.
Marinette	J. Wm. Boren, M. D.	Do.
Milwaukee	*John P. Koehler, M. D.	Commissioner of health.
	E. V. Brumbaugh, M. D.	Deputy commissioner of health.
	*George P. Barth, M. D.	Director.
School hygiene division.		
Division of venereal diseases.	*William J. McKillip, M. D.	Do.
Vital statistics.	*George E. Adams	Deputy register.
Division of tuberculosis.	*George R. Ernst, M. D.	Director.
Contagious disease division.	*Edward R. Krumbiegel, M. D.	Do.
Division of food and sanitary inspection.	*Stanley L. Pilgrim, M. D. C.	Do.
Bureau of laboratories.	*R. W. Cunliffe	Do.
Division of child welfare.	*E. V. Brumbaugh, M. D.	Do.
Division of nurses.		
Oshkosh	*Alma H. Brunk, R. N.	Do.
Racine	*Irvine A. Ihrke, M. D.	Health commissioner.
Sheboygan	*I. F. Thompson, M. D., M. P. H.	Commissioner of health.
Shorewood	*Gustav J. Hildebrand, M. D.	Commissioner of public health.
South Milwaukee	Jerome M. Jekel, M. D.	Health officer.
Stevens Point	R. D. Moray, M. D.	Health commissioner.
Superior	Ferdinand R. Krembs, M. D.	Health officer.
Two Rivers	*Charles H. Mason, M. D.	Health commissioner.
Watertown	Alfred P. Zlatnik, M. D.	Commissioner of health.
Waukesha	E. W. Bowen, M. D.	Health commissioner.
Wausau	Frank M. Scheele, M. D.	Do.
Wauwatosa	*L. F. Bugbee	Health officer.
West Allis	Roy T. Hansen, M. D.	Health commissioner.
	*Frank H. Russell, M. D.	Commissioner of health.
Wyoming:		
Casper	Joseph C. Kamp, M. D.	County health officer.
Cheyenne	W. R. Day, M. D.	County health physician.

DEATHS DURING WEEK ENDED NOVEMBER 20, 1937

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 20, 1937	Correspond- ing week, 1936
Data from 86 large cities of the United States:		
Total deaths	8,093	8,208
Average for 3 prior years	7,896	
Total deaths, first 46 weeks of year	393,980	394,881
Deaths under 1 year of age	807	490
Average for 3 prior years	539	
Deaths under 1 year of age, first 46 weeks of year	25,323	25,568
Data from industrial insurance companies:		
Policies in force	69,958,169	68,670,288
Number of death claims	13,583	13,263
Death claims per 1,000 policies in force, annual rate	10.1	10.1
Death claims per 1,000 policies, first 46 weeks of year, annual rate	9.7	9.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables a zero (0) is to be interpreted to mean that no cases or deaths occurred, while leaders (.....) indicate that cases or deaths may have occurred although none was reported.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 27, 1937, and Nov. 28, 1936

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936
New England States:								
Maine.....		2	2	9	37	11	0	0
New Hampshire.....		3			28	1	0	0
Vermont.....	1				64	1	0	0
Massachusetts.....	1	5			63	168	1	3
Rhode Island.....		3			4	94	1	0
Connecticut.....	12	1	5	1	3	43	1	0
Middle Atlantic States:								
New York.....	30	27	14	11	85	120	3	12
New Jersey.....	9	18	7	14	188	31	1	2
Pennsylvania.....	38	36			1,351	37	1	3
East North Central States:								
Ohio.....	36	41	26	28	230	12	1	26
Indiana.....	25	19	14	8	46	7	3	1
Illinois.....	64	36	12	9	340	13	1	5
Michigan.....	18	36	1	2	93	31	3	4
Wisconsin.....	5	3	41	12	34	20	0	2
West North Central States:								
Minnesota.....	4	12	1	1	7	7	1	2
Iowa.....	2		2	1	7	5	0	0
Missouri.....	47	28	25	90	604	6	0	7
North Dakota.....		1		50	5		1	0
South Dakota.....	1	1				3	0	0
Nebraska.....	7	4			2	1	0	0
Kansas.....	6	11	2	1	17	5	1	2
South Atlantic States:								
Delaware.....		2			1	2	0	0
Maryland ¹	23	16	5	9	6	75	2	3
District of Columbia.....	6	14	1	1	1	2	0	0
Virginia.....	35	55			63	34	6	8
West Virginia.....	13	20	23	20	40		1	5
North Carolina ¹	69	100	6	12	221	41	2	4
South Carolina ¹	9	21	238	213	11	17	1	4
Georgia ¹	20	39					4	0
Florida ¹	44	9	7	3	15		2	0
East South Central States:								
Kentucky.....	15	11	9	17	73	4	1	8
Tennessee ¹	21	43	66	63	110	7	6	2
Alabama ¹	29	44	81	104	8	1	7	2
Mississippi ¹	11	12					1	0

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended Nov. 27, 1937, and Nov. 28, 1936—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936
West South Central States:								
Arkansas.....	18	4	46	18	8		0	0
Louisiana.....	23	12	6	16		3	0	1
Oklahoma ¹	13	15	47	66	1	7	3	3
Texas ²	49	62	250	109	23	25	2	1
Mountain States:								
Montana.....		1		3	14	4	0	1
Idaho.....	1	5	3	4	2	63	1	3
Wyoming.....						1	0	0
Colorado.....	17	10			39	6	1	0
New Mexico.....	7	3	1	1	86	31	0	0
Arizona.....	8	8	101	56	13		0	0
Utah ²	9				15	8	0	0
Pacific States:								
Washington.....	7			3	9	11	2	2
Oregon.....	10		21	30	9	11	0	2
California ²	26	59	33	65	40	26	7	6
Total.....	789	832	1,096	1,050	4,016	985	68	124
First 47 weeks of year.....	24,507	25,048	283,149	148,052	264,309	274,781	4,998	6,857

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid and paratyphoid fevers		Whoop- ing cough
	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937
New England States:									
Maine.....	1	1	19	18	0	0	1	0	39
New Hampshire.....	0	0	5	14	0	0	0	0	1
Vermont.....	0	0	10	9	0	0	0	0	72
Massachusetts.....	0	0	163	144	0	0	9	1	125
Rhode Island.....	0	0	28	25	0	0	0	2	51
Connecticut.....	0	0	39	32	0	0	1	2	31
Middle Atlantic States:									
New York.....	7	3	259	310	0	0	6	9	346
New Jersey.....	0	0	39	74	0	0	1	4	82
Pennsylvania.....	2	7	349	296	0	0	16	16	
East North Central States:									
Ohio.....	1	9	375	343	0	2	9	15	122
Indiana.....	0	3	141	80	21	1	3	0	34
Illinois.....	2	8	411	342	6	0	6	14	71
Michigan.....	3	2	340	191	0	0	3	4	138
Wisconsin.....	1	0	165	232	1	5	2	2	163
West North Central States:									
Minnesota.....	2	1	102	176	11	1	0	0	77
Iowa.....	0	4	203	71	68	5	1	1	33
Missouri.....	5	2	169	94	5	6	13	19	32
North Dakota.....	0	0	20	85	19	16	2	1	22
South Dakota.....	1	0	26	45	1	1	0	1	13
Nebraska.....	0	0	15	51	0	4	0	0	7
Kansas.....	1	2	125	164	1	12	8	3	47
South Atlantic States:									
Delaware.....	0	0	9	8	0	0	0	0	3
Maryland ²	0	0	50	59	0	0	7	6	68
District of Columbia.....	0	0	11	12	0	0	0	0	5
Virginia.....	0	4	35	64	0	0	4	8	40
West Virginia.....	1	1	104	52	0	0	5	9	60
North Carolina ²	1	1	54	82	0	0	11	13	167
South Carolina ²	0	0	4	10	0	0	0	0	27
Georgia ²	0	7	18	44	2	0	9	6	4
Florida ²	0	2	10	10	1	0	1	1	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Nov. 27, 1937, and Nov. 28, 1936—Continued

Division and State	Polio-myelitis		Scarlet fever		Smallpox		Typhoid and paratyphoid fevers		Whoop- ing cough
	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937	Week ended Nov. 28, 1936	Week ended Nov. 27, 1937
East South Central States:									
Kentucky.....	0	2	69	34	4	0	3	8	61
Tennessee ¹	2	5	54	67	3	0	4	4	45
Alabama ²	2	0	21	27	1	0	6	18	17
Mississippi ³	6	4	17	24	2	0	8	14	-----
West South Central States:									
Arkansas.....	3	1	38	7	17	1	3	4	13
Louisiana.....	2	5	8	9	0	0	0	14	3
Oklahoma ⁴	0	11	56	14	4	2	9	8	28
Texas ⁵	2	4	91	85	0	1	31	9	163
Mountain States:									
Montana.....	0	0	29	56	35	30	3	1	19
Idaho.....	0	1	24	23	13	1	0	4	16
Wyoming.....	0	0	10	8	4	0	0	0	6
Colorado.....	2	0	43	34	8	2	1	0	9
New Mexico.....	0	0	26	16	0	0	5	2	51
Arizona.....	0	0	10	37	0	0	0	3	-----
Utah ⁶	1	0	52	20	0	0	1	0	18
Pacific States:									
Washington.....	2	2	32	50	31	0	2	1	73
Oregon.....	0	2	34	41	3	40	0	4	18
California ⁷	11	9	136	217	4	5	6	15	279
Total.....	60	103	4,048	3,896	255	135	201	246	2,700
First 47 weeks of year.....	9,248	4,272	199,748	210,273	9,571	6,660	14,321	13,756	-----

¹ New York City only.

² Week ended earlier than Saturday.

³ Typhus fever, week ended Nov. 27, 1937, 56 cases, as follows: North Carolina, 8; South Carolina, 3; Georgia, 17; Florida, 4; Tennessee, 8; Alabama, 9; Texas, 6; California, 1.

⁴ Rocky Mountain spotted fever, week ended Nov. 27, 1937, North Carolina, 1 case.

⁵ Figures for 1936 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Menin- gococ- cus menin- gitis	Diph- theria	Infl- uenza	Mala- ria	Mea- sles	Pel- lagra	Polio- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
October 1937										
Arizona.....	0	25	141	6	18	1	3	21	1	21
Georgia.....	6	181	154	427	53	37	6	158	2	40
Hawaii Territory.....	0	10	1,226	13	52	-----	0	1	0	7
Kansas.....	2	50	11	3	32	-----	29	454	4	8
Louisiana.....	1	61	33	149	2	9	13	44	0	43
Montana.....	1	1	71	-----	69	-----	4	63	50	13
New Mexico.....	3	10	3	2	82	2	4	83	4	58
Rhode Island.....	5	5	-----	-----	9	-----	2	73	0	2
South Dakota.....	0	4	10	-----	6	-----	5	81	0	5
Washington.....	3	11	8	-----	46	-----	23	122	53	9
Wisconsin.....	2	28	116	-----	105	-----	57	374	7	6

¹ Cases off shipping.

October 1937		October 1937—Con.		October 1937—Con.	
	Cases		Cases		Cases
Anthrax:		Hookworm disease:		Septic sore throat—Con.	
Georgia.....	1	Georgia.....	2,640	Montana.....	11
Montana.....	1	Hawaii Territory.....	20	New Mexico.....	1
Chicken pox:		Louisiana.....	56	Rhode Island.....	1
Arizona.....	16	Impetigo contagiosa:		South Dakota.....	1
Georgia.....	30	Hawaii Territory.....	38	Washington.....	6
Hawaii Territory.....	55	Rhode Island.....	14	Wisconsin.....	15
Kansas.....	243	Washington.....	7	Tetanus:	
Louisiana.....	3	Jaundice, infectious:		Hawaii Territory.....	1
Montana.....	115	Hawaii Territory.....	20	Louisiana.....	4
New Mexico.....	13	Leprosy:		New Mexico.....	1
Rhode Island.....	79	Hawaii Territory.....	6	Trachoma:	
South Dakota.....	68	Arizona.....	20	Arizona.....	26
Washington.....	295	Georgia.....	15	Georgia.....	1
Wisconsin.....	716	Hawaii Territory.....	27	Hawaii Territory.....	5
Conjunctivitis:		Kansas.....	129	South Dakota.....	1
Georgia.....	17	Louisiana.....	1	Wisconsin.....	2
New Mexico.....	2	Montana.....	25	Trichinosis:	
Washington.....	4	New Mexico.....	11	South Dakota.....	6
Dysentery:		Rhode Island.....	3	Georgia.....	2
Arizona.....	40	South Dakota.....	5	Kansas.....	2
Georgia (amoebic).....	16	Washington.....	229	Wisconsin.....	3
Georgia (bacillary).....	7	Wisconsin.....	103	Typhus fever:	
Hawaii Territory (amoebic).....	2	Ophthalmia neonatorum:		Georgia.....	108
Kansas (bacillary).....	1	Hawaii Territory.....	1	Hawaii Territory.....	4
Louisiana (amoebic).....	6	Louisiana.....	1	Louisiana.....	7
Montana.....	4	New Mexico.....	2	Undulant fever:	
New Mexico (amoebic).....	3	Georgia.....	1	Georgia.....	2
New Mexico (bacillary).....	2	Louisiana.....	2	Kansas.....	3
New Mexico (unspeci- fied).....	8	Montana.....	5	Louisiana.....	5
Washington (bacillary).....	2	New Mexico.....	1	Rhode Island.....	1
Encephalitis, epidemic or lethargic:		Puerperal septicemia:		Wisconsin.....	3
Arizona.....	2	New Mexico.....	2	Vincent's infection:	
Georgia.....	1	Rabies in animals:		Kansas.....	20
Kansas.....	6	Louisiana.....	17	Whooping cough:	
Louisiana.....	2	Rhode Island.....	2	Arizona.....	39
Rhode Island.....	1	Washington.....	10	Georgia.....	65
South Dakota.....	3	Rabies in man:		Hawaii Territory.....	8
Washington.....	3	Georgia.....	1	Kansas.....	258
Wisconsin.....	2	Louisiana.....	1	Louisiana.....	21
Food poisoning:		Scabies:		Montana.....	75
New Mexico.....	10	Kansas.....	4	New Mexico.....	113
German measles:		Rhode Island.....	1	Rhode Island.....	92
Arizona.....	3	Septic sore throat:		South Dakota.....	128
Kansas.....	2	Georgia.....	46	Washington.....	184
Montana.....	7	Hawaii Territory.....	1	Wisconsin.....	788
Washington.....	11	Kansas.....	4		
Wisconsin.....	38	Louisiana.....	21		

PLAGUE INFECTION IN FRESNO COUNTY, CALIF.

Under date of November 23, 1937, Dr. W. M. Dickie, Director of Public Health of California, reported that plague infection had been proved, by animal inoculation, in a pool of organs from six golden mantled squirrels collected on November 4 at Shaver Lake, Fresno County, Calif.

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 20, 1937

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities: 5-year average	315	306	48	476	560	1,193	7	353	38	913	-----
Current week	237	134	41	1,314	548	1,025	11	318	35	872	-----
Maine:											
Portland	0	1	0	0	3	1	0	0	0	5	34
New Hampshire:											
Concord	0	-----	1	0	0	0	0	0	0	0	12
Manchester	1	-----	0	0	0	4	0	0	0	0	11
Nashua	0	-----	-----	1	-----	0	0	-----	0	4	3
Vermont:											
Barre	0	-----	0	25	1	0	0	0	0	0	8
Burlington	0	-----	0	0	0	0	0	0	0	1	9
Rutland	0	-----	0	6	0	0	0	0	0	2	10
Massachusetts:											
Boston	1	-----	0	44	17	38	0	14	0	21	213
Fall River	1	-----	0	1	0	1	0	2	0	23	22
Springfield	0	-----	0	0	0	11	0	3	0	11	34
Worcester	1	-----	0	0	1	1	0	2	0	1	43
Rhode Island:											
Pawtucket	0	-----	0	1	0	4	0	0	0	1	13
Providence	0	-----	0	0	2	20	0	1	1	35	59
Connecticut:											
Bridgeport	0	-----	0	0	0	2	0	0	0	1	29
Hartford	0	-----	0	1	2	19	0	0	1	2	23
New Haven	0	3	0	0	1	5	0	1	0	0	41
New York:											
Buffalo	0	-----	0	1	6	14	0	4	0	21	127
New York	24	11	3	41	80	84	0	66	5	137	1,357
Rochester	0	-----	0	1	3	1	0	3	0	7	66
Syracuse	0	-----	0	0	6	40	0	0	0	17	51
New Jersey:											
Camden	4	-----	0	1	0	7	0	1	0	0	23
Newark	0	1	0	3	3	18	0	4	0	24	108
Trenton	0	-----	0	80	4	0	0	1	0	1	41
Pennsylvania:											
Philadelphia	6	8	3	22	36	69	0	15	3	40	482
Pittsburgh	3	4	3	244	25	30	0	10	1	22	169
Reading	0	-----	0	2	2	1	0	0	1	0	29
Scranton	0	-----	-----	5	-----	0	0	-----	0	0	-----
Ohio:											
Cincinnati	7	-----	0	2	11	17	0	6	0	4	144
Cleveland	2	7	2	47	13	48	0	6	0	33	186
Columbus	5	1	1	0	4	8	0	5	0	5	92
Toledo	0	2	2	4	3	0	0	4	3	7	66
Indiana:											
Anderson	1	-----	0	0	0	7	0	1	0	3	9
Fort Wayne	1	-----	0	0	3	1	0	0	0	0	23
Indianapolis	12	-----	0	2	10	19	0	5	0	12	103
Muncie	1	-----	0	4	1	3	1	2	0	1	14
South Bend	0	-----	0	0	1	1	0	0	0	4	17
Terre Haute	0	-----	0	0	0	0	0	0	0	0	12
Illinois:											
Alton	0	-----	0	43	0	2	0	0	0	0	6
Chicago	21	8	7	70	35	102	0	29	2	29	700
Elgin	0	-----	0	0	1	0	0	0	0	1	9
Moline	0	-----	0	0	1	18	0	0	0	1	5
Springfield	0	-----	0	0	1	3	0	0	0	2	16
Michigan:											
Detroit	13	1	0	52	34	113	0	17	1	52	250
Flint	5	-----	0	3	3	13	2	1	0	4	22
Grand Rapids	0	-----	1	1	2	28	0	0	0	5	35
Wisconsin:											
Kenosha	0	-----	0	0	0	0	0	0	0	0	6
Madison	1	-----	0	0	3	5	0	0	0	3	29
Milwaukee	0	-----	0	49	9	11	0	2	0	29	86
Racine	0	-----	0	0	0	3	0	0	0	2	11
Superior	0	-----	0	1	0	3	0	0	0	1	6

City reports for week ended Nov. 20, 1937—Continued

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
Minnesota:											
Duluth	0		0	0	1	10	0	0	0	4	28
Minneapolis	1		0	3	3	27	0	0	1	10	94
St. Paul	0		0	0	4	5	0	2	0	8	63
Iowa:											
Cedar Rapids	0			0		0	0		0	2	
Davenport	1			0		2	0		0	0	
Des Moines	1			0		23	2		0	0	27
Sioux City	0		0	1		3	1		0	1	
Waterloo	0			0		4	0		0	3	
Missouri:											
Kansas City	1		0	1	11	15	0	5	0	4	94
St. Joseph	5		0	1	2	6	1	1	0	0	20
St. Louis	20		0	536	18	36	0	7	0	13	103
North Dakota:											
Fargo	0		0	0	3	1	0	0	0	7	15
Grand Forks	1			0		10	1		0	0	
Minot	0		0	0	0	0	1	0	0	7	5
South Dakota:											
Aberdeen	2			0		9	0		0	3	
Nebraska:											
Omaha	0		0	1	4	1	0	1	0	1	56
Kansas:											
Topeka	0		0	0	5	3	0	0	0	6	20
Wichita	0		0	2	2	3	0	0	0	1	21
Delaware:											
Wilmington	0		0	0	3	12	0	0	0	4	30
Maryland:											
Baltimore	17	3	1	1	20	22	0	12	2	55	100
Cumberland	0		0	0	0	0	0	1	0	0	20
Frederick	0		0	0	0	0	0	0	0	0	5
Dist. of Col.:											
Washington	5		0	5	11	19	0	10	0	5	145
Virginia:											
Lynchburg	3		1	0	0	2	0	0	0	1	14
Norfolk	3		0	6	0	3	0	3	0	0	24
Richmond	3		2	0	4	8	0	0	0	0	30
Roanoke	1		0	0	4	2	0	0	0	1	18
West Virginia:											
Charleston	0	2	0	0	1	1	0	0	0	0	5
Huntington	4			11		2	0		0	0	
Wheeling	0	1	0	0	2	2	0	0	0	9	11
North Carolina:											
Gastonia	0	1		0		1	0		0	3	
Raleigh	1		0	1	4	1	0	1	0	39	13
Wilmington	0		0	0	1	2	0	1	0	0	8
Winston-Salem	0		0	0	0	5	0	0	3	6	7
South Carolina:											
Charleston	0	10	0	0	5	3	0	0	0	0	22
Florence	1		0	0	1	0	0	0	0	0	16
Greenville	0		0	0	2	1	0	0	0	3	6
Georgia:											
Atlanta	7	30	2	8	9	0	0	6	0	7	86
Brunswick	0		0	0	0	0	0	0	0	0	1
Savannah	0	2	1	0	2	0	0	1	0	0	37
Florida:											
Miami	0		0	53	0	2	0	3	0	5	25
Tampa	2	1	1	1	3	1	0	0	0	0	19
Kentucky:											
Covington	0	1	0	1	3	1	0	3	0	4	21
Lexington	0		0	1	1	0	0	1	0	2	18
Louisville	4	1	0	14	7	22	0	2	0	20	71
Tennessee:											
Knoxville	4		1	0	1	2	0	1	0	0	17
Memphis	6		1	24	6	3	0	5	0	6	80
Nashville	4		1	1	4	3	0	0	0	0	45
Alabama:											
Birmingham	9	13	1	4	5	3	0	8	0	0	83
Mobile	0		0	0	0	0	0	1	0	0	22
Montgomery	2			0		1	0		0	4	
Arkansas:											
Fort Smith	1			0		6	0		0	2	
Little Rock	2		1	1	7	0	0	1	0	0	9
Louisiana:											
Lake Charles	0		0	0	0	0	0	0	0	0	4
New Orleans	0	2	0	0	11	8	0	11	6	2	160
Shreveport	4		0	0	6	2	0	2	0	0	48

City reports for week ended Nov. 20, 1937—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Oklahoma:											
Muskogee	0			0		2	0		1	0	
Oklahoma City	1		0	0	7	2	0	2	0	0	49
Tulsa	0			0		6	0		0	15	
Texas:											
Dallas	2	1	1	0	3	12	0	4	1	3	60
Fort Worth	1		0	0	3	3	0	2	0	6	37
Galveston	0		0	0	3	1	0	1	2	0	17
Houston	6		0	0	5	2	0	5	0	0	78
San Antonio	0		0	0	5	0	0	4	0	1	45
Montana:											
Billings	0		0	0	2	0	0	0	1	0	6
Great Falls	0		0	0	1	0	6	0	0	13	6
Helena	0		0	0	0	1	0	0	0	5	4
Missoula	0	4	1	0	2	0	0	0	0	0	9
Idaho:											
Boise	0		0	0	2	0	1	0	0	0	12
Colorado:											
Colorado Springs	0		0	0	2	4	0	3	0	0	15
Denver	6		3	23	7	13	0	0	0	4	71
Pueblo	0		0	1	2	0	0	0	0	0	15
New Mexico:											
Albuquerque	0		0	18	0	0	0	2	1	2	10
Utah:											
Salt Lake City	0		2	1	3	15	0	0	0	8	30
Washington:											
Seattle	0		0	2	9	2	0	4	2	10	90
Spokane	0		0	1	5	0	0	0	1	3	38
Tacoma	0		0	0	2	4	1	1	0	9	35
Oregon:											
Portland	8	3	0	4	1	6	1	1	0	0	63
Salem	0					0	0		0	0	
California:											
Los Angeles	15	13	1	0	14	27	0	12	1	18	343
Sacramento	1	1	0	1	0	0	0	2	0	20	20
San Francisco	1	6	0	2	4	1	0	11	0	39	167

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Maryland:			
Boston	0	0	1	Baltimore	1	1	1
Worcester	0	1	1	District of Columbia:			
Rhode Island:				Washington	3	1	0
Providence	0	0	1	West Virginia:			
New York:				Charleston	0	0	1
New York	2	1	2	Georgia:			
New Jersey:				Atlanta	0	0	1
Camden	0	0	1	Florida:			
Pennsylvania:				Tampa	1	0	2
Philadelphia	0	0	1	Kentucky:			
Indiana:				Louisville	1	0	0
Indianapolis	0	0	1	Tennessee:			
Illinois:				Knoxville	3	0	0
Chicago	3	1	0	Nashville	1	0	0
Michigan:				Alabama:			
Detroit	1	1	0	Birmingham	2	1	0
Flint	0	0	1	Louisiana:			
Wisconsin:				Lake Charles	1	0	0
Milwaukee	0	0	1	New Orleans	0	0	1
Minnesota:				Shreveport	0	1	0
Minneapolis	1	0	0	Texas:			
St. Paul	0	0	1	Dallas	1	1	0
Iowa:				Colorado:			
Des Moines	0	0	1	Denver	0	0	1
Missouri:				Pueblo	0	0	2
Kansas City	0	0	1	California:			
St. Joseph	0	0	1	Los Angeles	0	0	1
St. Louis	0	0	1	San Francisco	0	0	8

Encephalitis, epidemic or lethargic.—Cases: Toledo, 1; Kansas City, 1; St. Louis, 1; Cumberland, 1; Washington, 1; Spokane, 1.

Pellagra.—Cases: Atlanta, 1; Memphis, 1; Birmingham, 1; San Antonio, 1; Los Angeles, 1.

Rabies in man.—Deaths: Nashville, 1.

Typhus fever.—Cases: Charleston, S. C., 2; Savannah, 2; Houston, 1; Los Angeles, 2.

FOREIGN AND INSULAR

BELGIUM

Vital statistics—1936.—The following table shows the vital statistics for Belgium for the year 1936:

Number of marriages.....	64, 749
Marriages per 1,000 inhabitants.....	7. 77
Number of live births.....	126, 710
Number of live births per 1,000 inhabitants.....	15. 21
Number of deaths.....	106, 190
Number of deaths per 1,000 inhabitants.....	12. 75

CANADA

Provinces—Communicable diseases—2 weeks ended November 6, 1937.—During the 2 weeks ended November 6, 1937, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Mani- toba	Sas- katch- ewan	Alberta	British Colum- bia	Total
Cerebrospinal men- ingitis.....			1		1			1		3
Chicken pox.....		20		145	266	138	76	31	154	830
Diphtheria.....		1	5	175	9	9	4	1		204
Dysentery.....			1	6	3					10
Erysipelas.....				12	4	3	2	1	5	27
Influenza.....		2			6				8	16
Measles.....		26	3	108	82	3	64	24	124	404
Mumps.....		15			160	7	3	8	14	267
Paratyphoid fever.....					2					2
Pneumonia.....		2			19		7		15	43
Poliomyelitis.....		1	7	2	47	14	51	13	2	137
Scarlet fever.....		18	7	316	164	50	66	65	51	737
Smallpox.....				1						1
Tuberculosis.....	3	10	6	84	75	49	21	3	18	269
Typhoid fever.....		15	17	67	14	3	27	1	1	145
Undulant fever.....					3	1				4
Whooping cough.....		6	1	336	159	63	31	54	50	700

FINLAND

Communicable diseases—October 1937.—During the month of October 1937, cases of certain communicable diseases were reported in Finland as follows

Disease	Cases	Disease	Cases
Diphtheria.....	501	Poliomyelitis.....	53
Dysentery.....	10	Scarlet fever.....	846
Influenza.....	1, 575	Typhoid fever.....	29
Lethargic encephalitis.....	1	Undulant fever.....	3
Paratyphoid fever.....	123		

ITALY

Communicable diseases—4 weeks ended September 12, 1937.—During the 4 weeks ended September 12, 1937, cases of certain communicable diseases were reported in Italy as follows:

Disease	Aug. 16-22		Aug. 23-29		Aug. 30-Sept. 5		Sept. 6-12	
	Cases	Com-munes affect-ed	Cases	Com-munes affect-ed	Cases	Com-munes affect-ed	Cases	Com-munes affect-ed
Anthrax.....	65	34	43	36	70	43	45	38
Cerebrospinal meningitis.....	15	15	11	10	10	10	7	7
Chicken pox.....	72	57	60	53	59	43	58	42
Diphtheria.....	455	264	473	266	501	263	577	302
Dysentery.....	122	57	124	65	104	57	80	47
Hookworm disease.....	13	8	18	11	8	5	17	7
Lethargic encephalitis.....			2	2			1	1
Measles.....	427	191	480	171	330	161	314	152
Mumps.....	120	54	105	59	92	50	97	49
Paratyphoid fever.....	258	152	230	143	275	150	282	159
Poliomyelitis.....	76	60	67	51	67	60	60	47
Puerperal fever.....	41	39	30	28	43	39	23	21
Scarlet fever.....	207	111	200	97	259	126	244	109
Typhoid fever.....	1,282	653	1,405	678	1,462	709	1,402	650
Undulant fever.....	62	53	60	50	60	46	54	46
Whooping cough.....	370	152	386	138	343	146	298	119

PANAMA CANAL ZONE

Notifiable diseases—July-September 1937.—During the months of July, August, and September 1937, certain notifiable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	July		August		September	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox.....	6		6		11	
Diphtheria.....	29		25		15	
Dysentery (amoebic).....	6	1	13		7	
Dysentery (bacillary).....	1	1	6	1	1	1
Leprosy.....	3				1	
Lethargic encephalitis.....					1	
Malaria.....	165	3	106		94	3
Measles.....	25		16			
Meningococcus meningitis.....	1		1			
Mumps.....	48		41		44	
Pneumonia.....		29		20		28
Poliomyelitis.....			1			
Scarlet fever.....			1	1		
Tuberculosis.....		29		27		26
Typhoid fever.....	3	2	1		3	
Typhus fever.....			1		1	
Whooping cough.....	8			5		13

YUGOSLAVIA

Communicable diseases—4 weeks ended November 7, 1937.—During the 4 weeks ended November 7, 1937, certain communicable diseases were reported in Yugoslavia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax.....	42	4	Poliomyelitis.....	4	1
Cerebrospinal meningitis.....	17	6	Scarlet fever.....	474	3
Diphtheria and croup.....	1,435	79	Sepsis.....	13	2
Dysentery.....	199	18	Tetanus.....	34	13
Erysipelas.....	226	2	Typhoid fever.....	882	70
Measles.....	66	-----	Typhus fever.....	5	-----
Paratyphoid fever.....	16	-----	Well's disease.....	1	-----

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for November 26, 1937, pages 1738-1752. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued December 31, 1937, and thereafter, at least for the time being, in the issue published on the last Friday of each month.

Cholera

China.—Cholera has been reported in China as follows: Week ended October 9, 1937, 2 cases in Mukden, Manchuria; week ended November 13, 19 cases in Swatow; week ended November 20, 1 case in Hong Kong, 1 case in Macao, and 49 cases in Shanghai.

Plague

Hawaii Territory—Island of Hawaii—Hamakua District—Hamakua Mill Sector.—A rat found on November 20, 1937, in Hamakua Mill Sector, Hamakua District, Island of Hawaii, Hawaii Territory, has been proved plague infected.

United States—California.—A report of plague infection in California appears on page 1843 of this issue of PUBLIC HEALTH REPORTS.

Smallpox

French Indochina—Haiphong.—During the week ended November 13, 1937, 2 cases of smallpox with 1 death were reported in Haiphong, French Indochina.

Yellow Fever

Colombia—Santander Department—Velez.—On October 26, 1937, 2 deaths from yellow fever were reported in Velez, Santander Department, Colombia.

Senegal.—Yellow fever has been reported in Senegal as follows: November 22, 1 suspected case in Ker Moussa; November 5-7, 2 cases with 2 deaths in Rufisque; November 23, 1 case on the aviation field at Thies.